# The Far Eastern Review

ENGINEERING + FINANCE + COMMERCE

THE PIONEER IN ITS FIELD

A Monthly Review of Far Eastern Trade, Finance and Engineering, Dedicated to the Industrial Development and Advancement of Trade in Far Eastern Countries.

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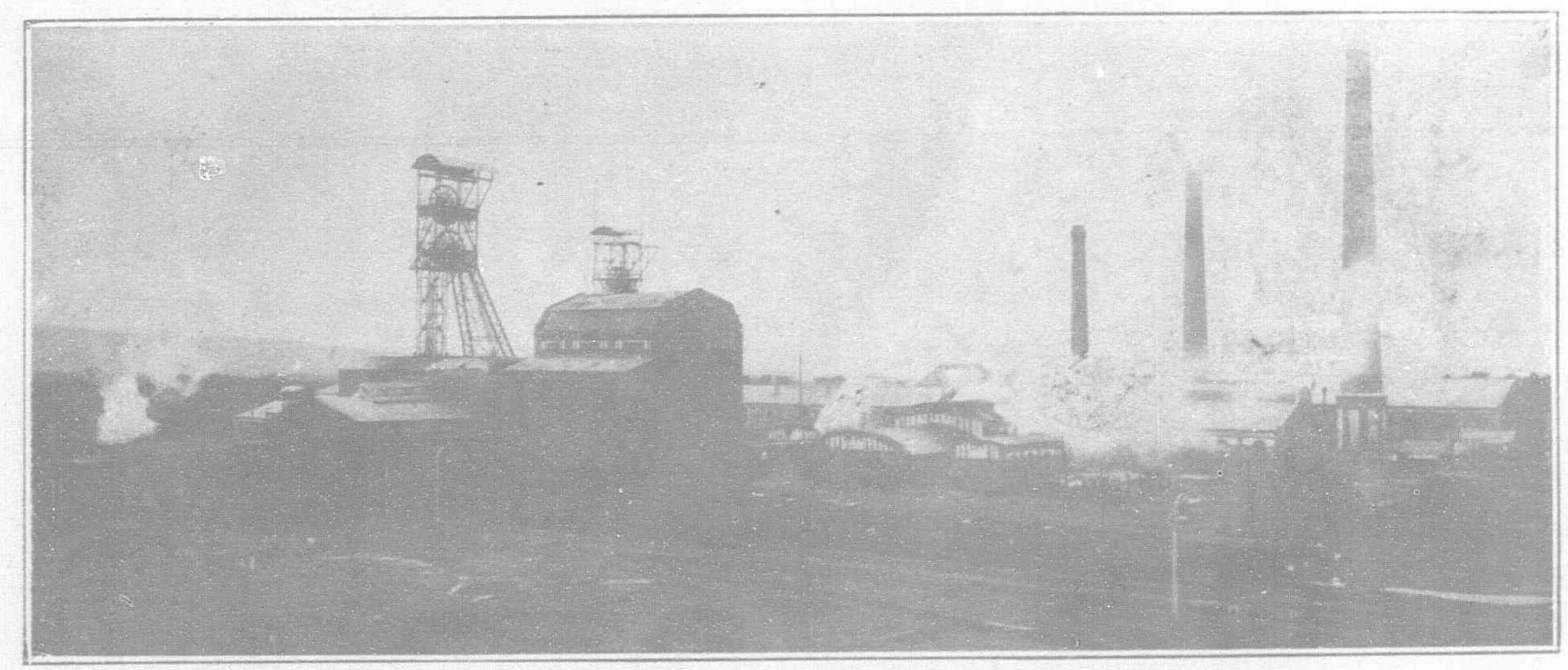
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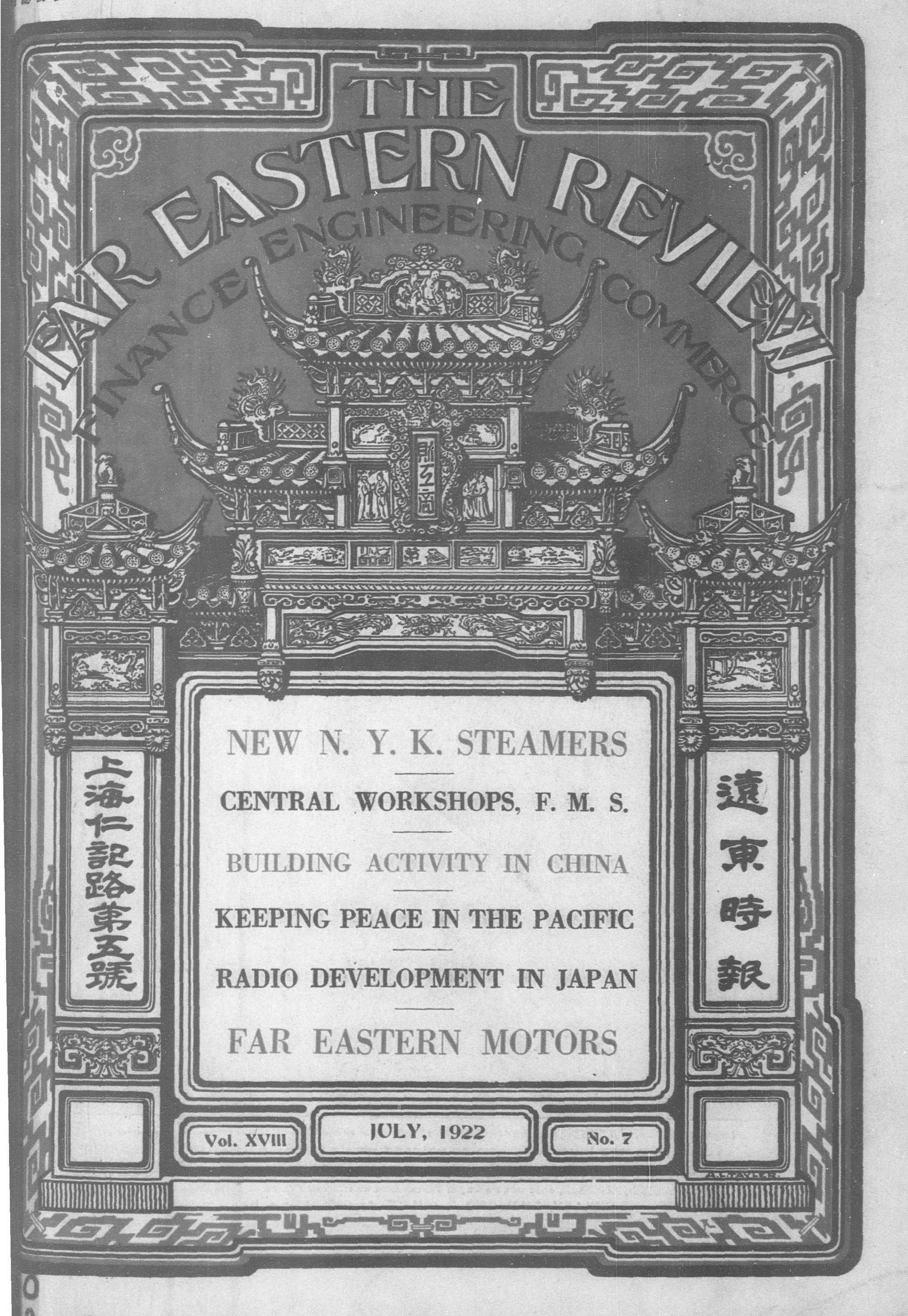
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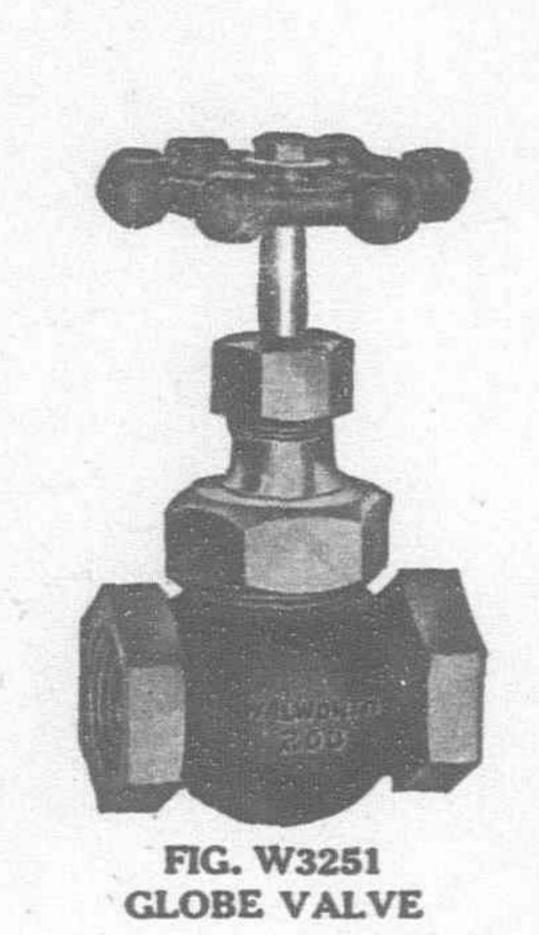
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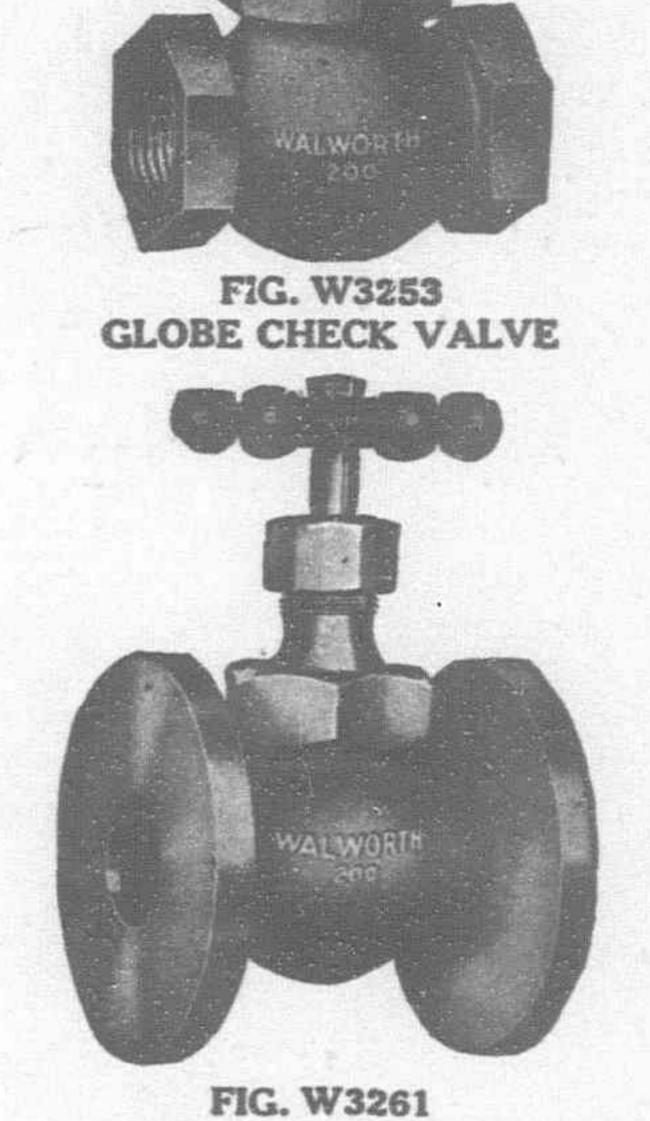


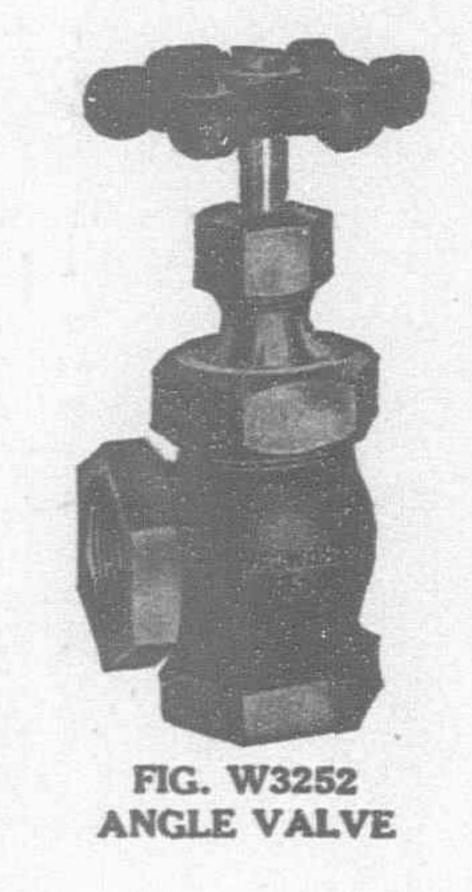
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# The Far Eastern Review

ENGINEERING

FINANCE

COMMERCE

VOL. XVIII

SHANGHAI, JULY, 1922

No. 7

## New N. Y. K. Steamers

#### Keeping Ahead of the Procession

N the keen competition for the first-class passenger traffic to and from the Orient, the Japanese do not intend to be outdone by their many rivals, and with each step forward on the part of other companies, the Nippon Yusen Kaisha keeps always abreast of the best, at times taking the lead in establishing standards for the well-being of its passengers which are most difficult for others to follow. While perhaps other companies may excel in the luxurious fittings and ornamentation of the saloons and staterooms of their crack steamships, the Japanese follow closely the artistic traditions of their own country. Cleanliness and comfort combined with the courtesy of attendance has won for their steamers a high place in the esteem of discriminating travelers.

Shanghai-Nagasaki Express Service

One of the greatest boons to the traveling public and general trade in the Far East will be the establishment of a rapid express service between China and Japan by frequent sailings of high-powered steamships specially constructed for the run between Shanghai and Nagasaki or Moji. The Japanese have long sensed the urgent necessity for such a service not only for the advancement of their own trade and mail facilities with China but for the general benefit of all residing and doing business in the Orient. To meet this demand the N.Y.K. is constructing two express steamers, the Nagasaki Maru and the Shanghai Maru. They are expected to be placed in operation some time this coming autumn and are now rapidly nearing completion in the Goven Yards of William Denny & Brothers, Ltd., of Dumbarton, Scotland. They will have a displacement of 6,150 tons (5,500 tons gross) with a length of 410-ft., width 54-ft., depth 32-ft., speed of 18½ knots and accommodation for 320 passengers.

#### Luxurious Accommodations

The steamers now employed on the Shanghai lines take about 48 hours for running the distance of 450 nautical miles between Moji and Shanghai, and about 36 hours between Nagasaki and Shanghai. The new steamers have been designed solely for the carriage of passengers, and will be completely equipped and furnished with the utmost regard for the safety and comfort of passengers during the voyage. The crossing will be made in about ten hours less than the time taken by other liners. In other words, if the steamer sails from Nagasaki at 10 a.m., it will reach Shanghai at about 1 p.m. the following day. Special consideration will also be given to scheduling the departures and arrivals of the steamers so as to facilitate connections with the railways in Japan and China. When these plans are put into effect, travelers between points in Japan and Shanghai, or vice versâ, can economize time to a considerable extent, with similar facility and advantage for passengers between Japan and interior points of China.

The new steamers having been planned principally for the conveyance

The "Chitose Maru"

2,700 tons gross, speed 12 knots, 2,000 H.P. Built by the Yokohama Dockyard for the Hokkaido-Saghalien service of the N.Y.K.

planned principally for the conveyance of passengers, the utmost attention and consideration is being given to their construction and furnishing, so as to ensure the maximum of safety, comfort and convenience. They will be equipped with magnificent social halls, dining saloons and smoking rooms, as well as inquiry offices, verandah cafés, bars and promenade spaces, with ample provision for the recreation and exercise of passengers. The steamers will carry only first and third-class passengers. The first-class cabin accommodation will consist of special staterooms, single, double and four berth cabins, etc., with different rates for each kind of room, thus offering a wide choice of accommodation to passengers. Now about the third-class accommodation. Heretofore accommodation for the third-class passengers on any steamer has been far from satisfactory. But the N.Y.K. took the initiative in improving it and has already effected considerable improvements on most of its steamers, thereby gaining the approbation of the traveling public. The improvements to be introduced in the new Shanghai liners are still more remarkable. Minute attention will be paid to the enlargement of space, efficient ventilation and lighting, complete sanitary arrangements of the rooms, etc. Independent dining, smoking and bar rooms of European style will be provided, in addition to a public

July, 1922

### NEW N. Y. K. STEAMERS

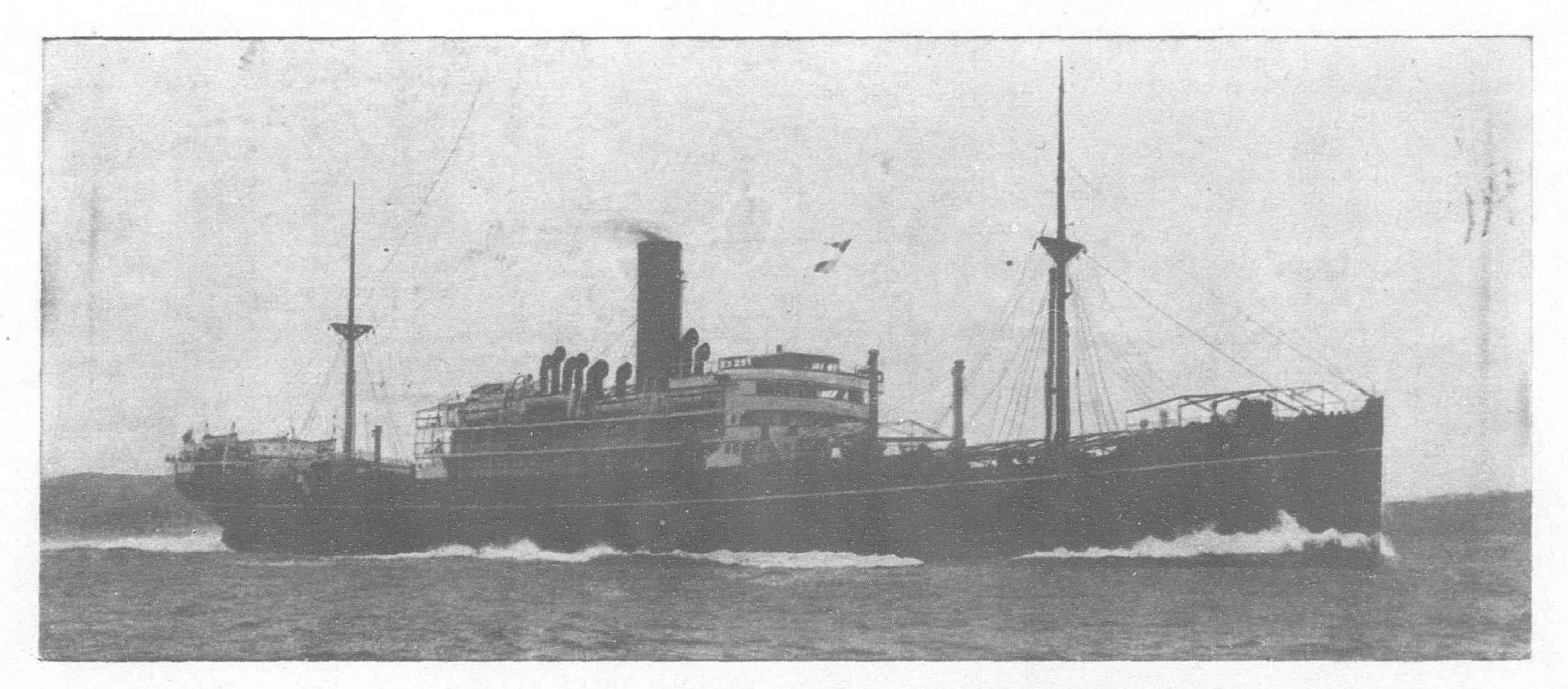
VIEWS OF THE "HAKONE MARU" THE FIRST OF THREE NEW STEAMERS FOR THE EUROPEAN SERVICE



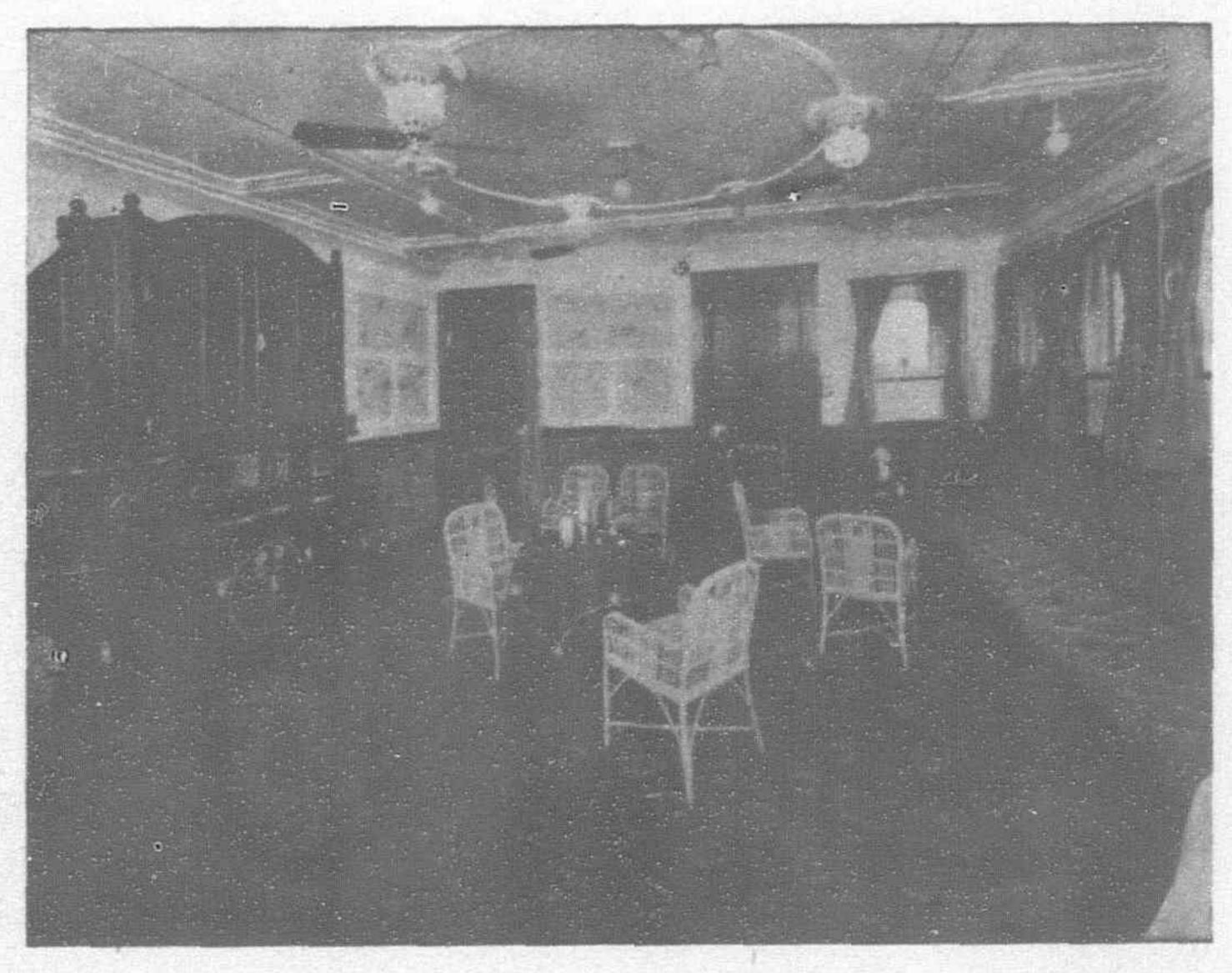
Dining Saloon



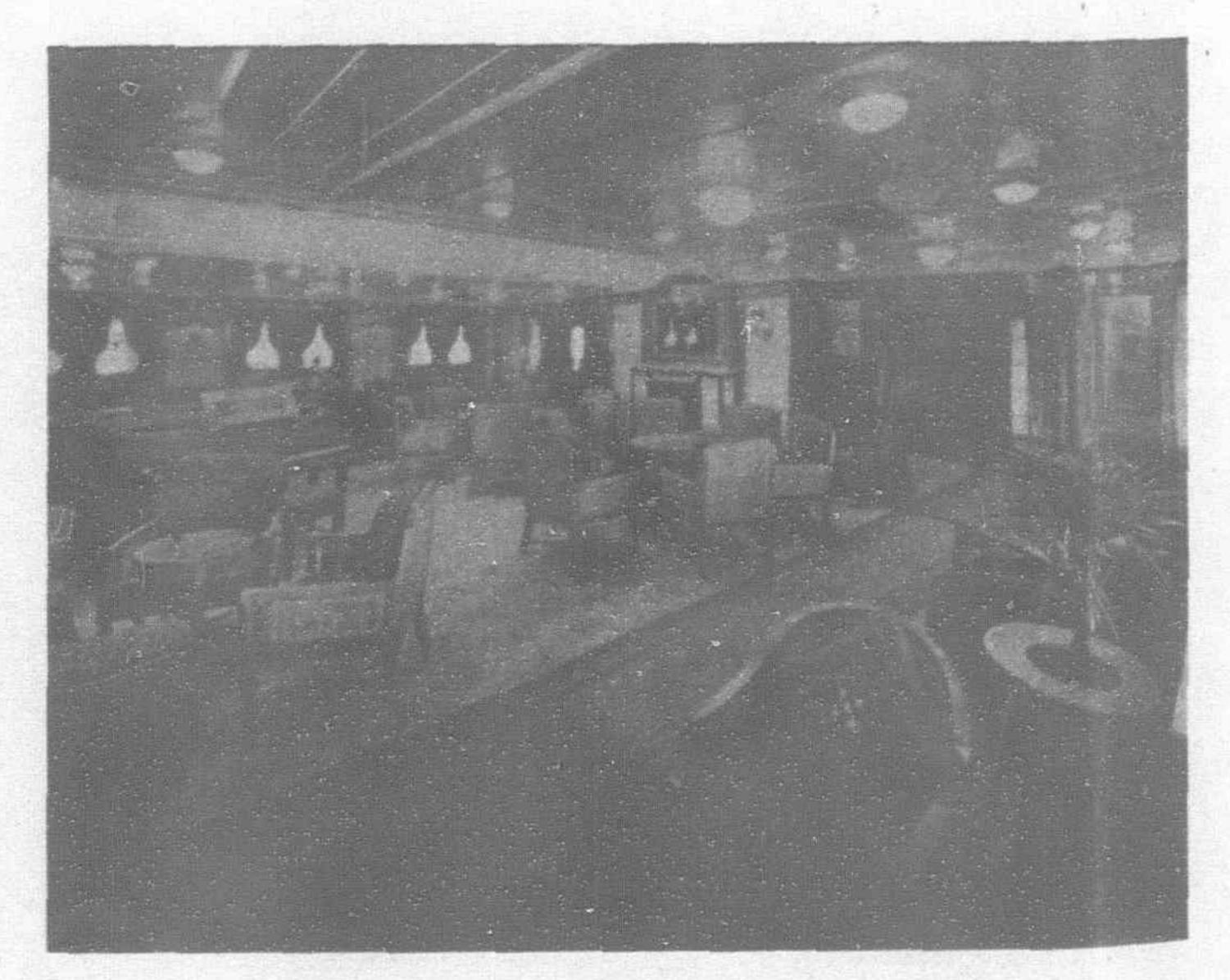
Verandah Cafe



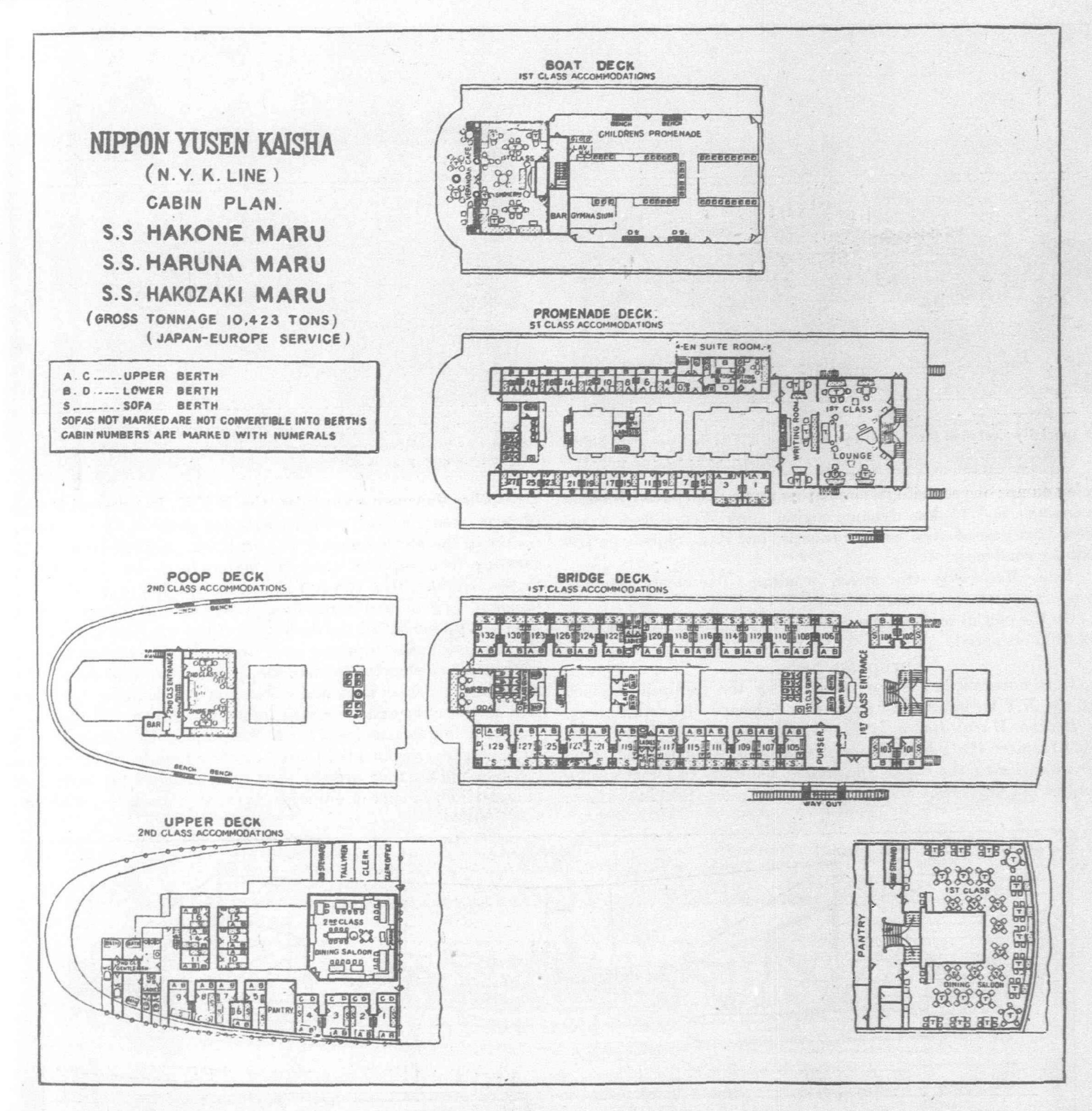
N. Y. K. Steamer "Hakone Maru," Built and Engined at the Nagasaki Works of the Mitsubishi Zosen Kaisha, Ltd.



Children's Nursery



Lounge



means of amusement à la Japonaise. Needless to say, the lavatories and bath rooms are up-to-date and complete in equipment. In fine, the N.Y.K. confidently believe that the new fast steamers will give the traveling public entire satisfaction, and that the realization of the scheme will establish one more link to unite in friendly relations the countries of China and Japan.

#### New Hokkaido-Saghalien Steamer

Another of the forward steps taken by the N.Y.K. to facilitate Far Eastern travel has been the building of the Chitose Maru for the Hokkaido and Saghalien line. The placing of this steamer on the run in June last marked a new era in the opening up of these northern regions. Heretofore, steamers plying between the Hokkaido and Saghalien were all inferior vessels of under 1,000 tons. The new steamer was built by the Yokohama Dockyard to a special design which brings her for all practical purposes into the icebreaker class. In size, she is the largest in the northern service,

being 2,700 tons gross, 300-ft. long and 43-ft. beam, developing about 2,000 horsepower and a speed of 12 knots, with a big reserve of power. She has accommodations for more than 450 passengers and being specially designed for this service is provided with heating system, wireless apparatus, ice-breaking arrangement and all modern conveniences conducive to the safety and comfort of the passengers and crew and the efficient handling of cargo.

This comfortable steamer has naturally become the favorite

for northern travel and shipments.

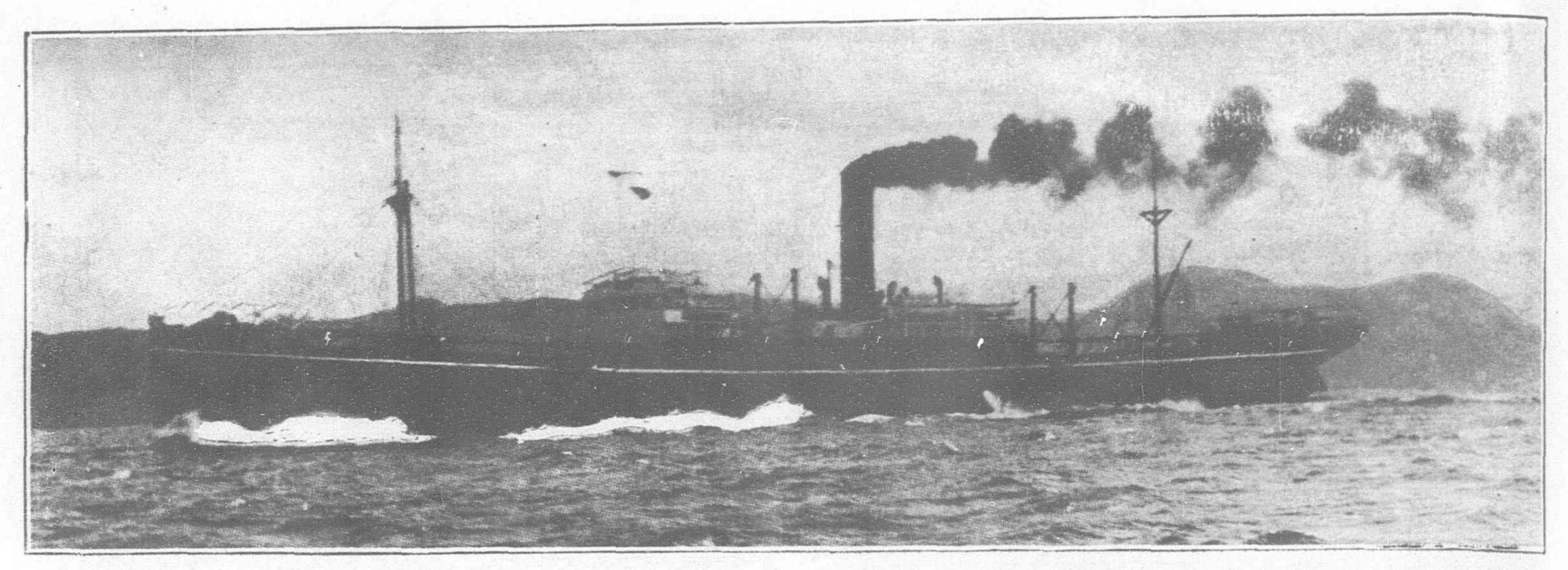
The engine room equipment of the Chitose Maru is as follows:

Main Engine—Single screw driven by a set of triple-expansion engines, cylinders, 23-in., 38-in., 64-in. dia. with common stroke of 48-in. Propeller of cast steel with four loose blades.

Boilers—200-lb. steam supplied from three 14-ft. dia. by 11-ft. 9½-in. long boilers. Parry's soot blowers are fitted to

clean boiler tubes.

Engine Room Auxiliaries—Two Weir's main feed pumps; one Weir's donkey feed pump; one ballast pump; one General service



The N.Y.K. T-class Geared Turbine Freighters "Toyooka Maru," "Toyama Maru" and "Toyohashi Maru," each of 10,000 tons Deadweight, specially designed for the European service. The first two ware built and engined by the Mitsubishi Dockyard and Engine Works at Nagasaki, and the last by the Kawasaki Dockyard Company at Kobe

duplex pump; one centrifugal circulating pump; one forced draught fan engine; one 15 kw. dynamo engine; one Weir's feed water heater: one cascade feed water cleanser; one Prof. Shiba's patent auxiliary condenser.

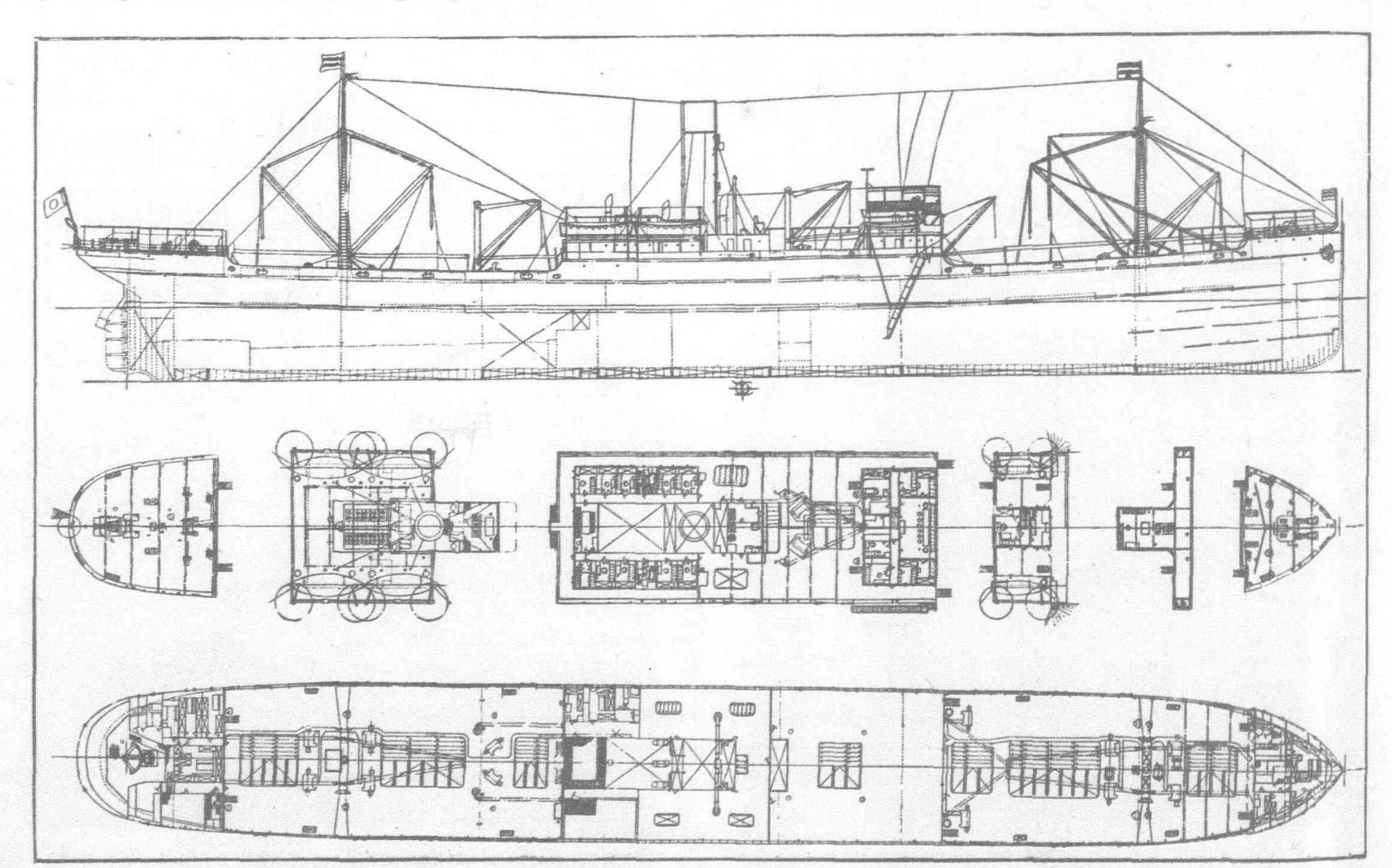
Deck Machinery—One steam windlass; one steam steering engine; six horizontal steam winches.

On the official sea trial she developed 4,000 I.H.P. at 93 r.p.m. and 15 knots speed.

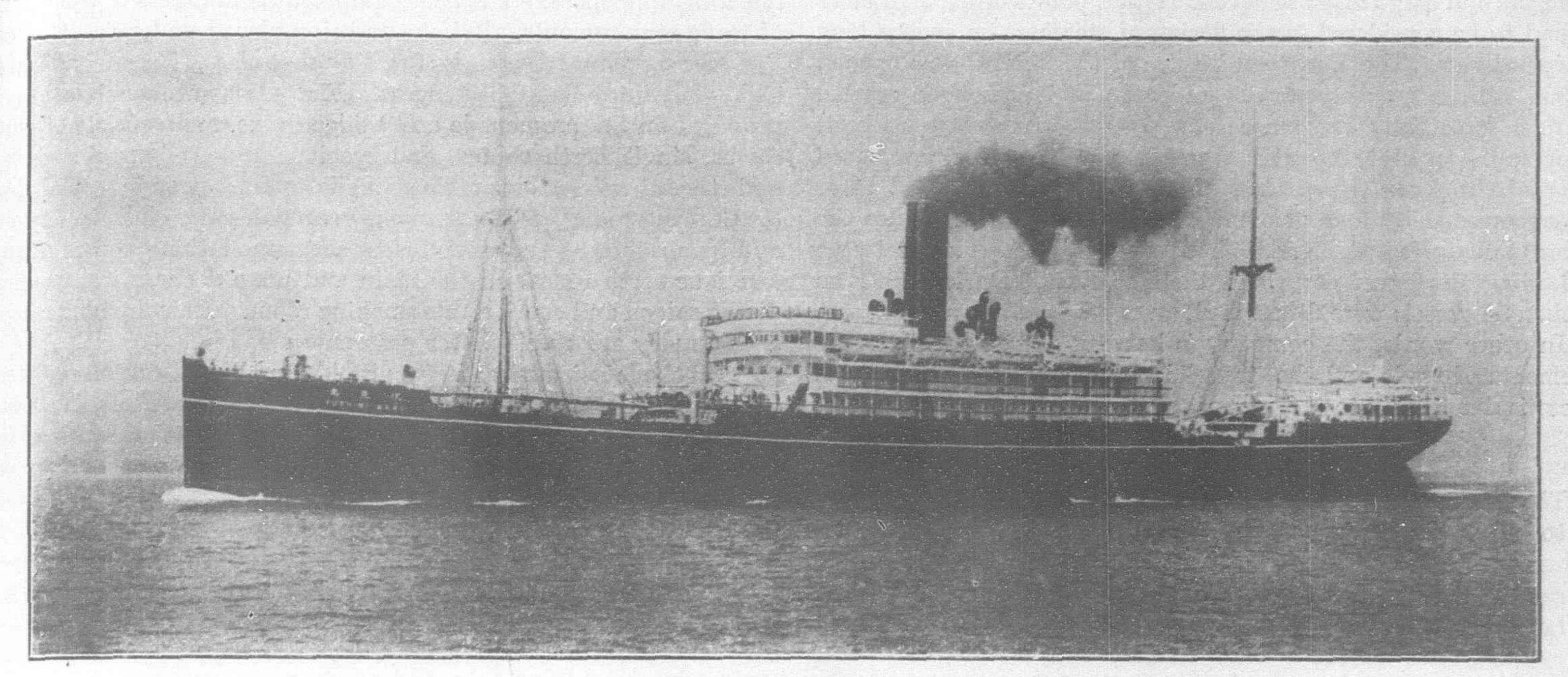
European Service

It is, however, in the new steamers for the European service that the N.Y.K. is demonstrating its efficiency. These steamers, the *Hirano Maru*, *Hakozaki Maru* and the *Haruna Maru* were built to replace the *Yasaka Maru*, *Miyazaki Maru* and the *Hirano Maru* lost during the war. The present tendency to forget events of only a few years back and criticize Japan ignores that in common

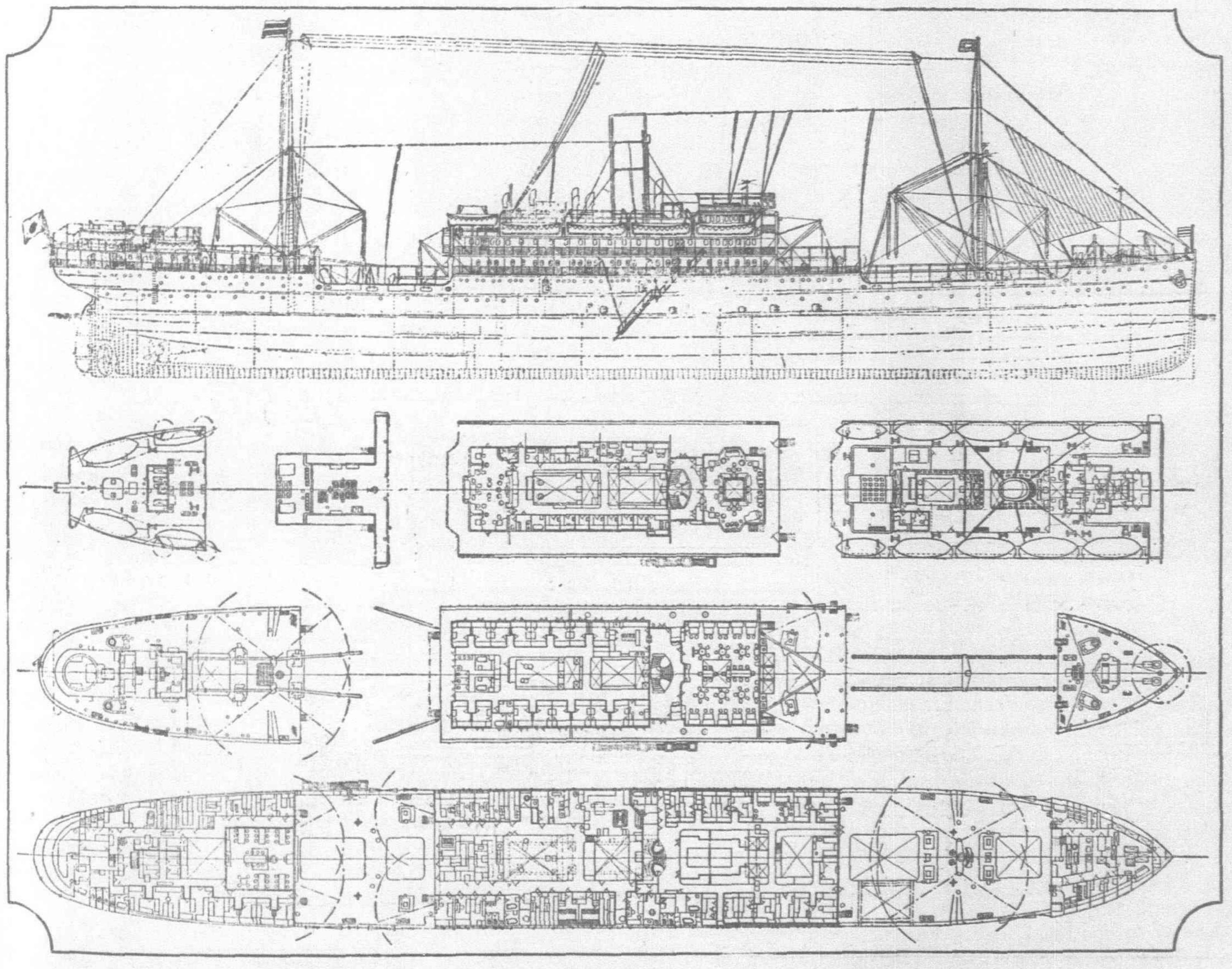
with other Japanese companies, the N.Y.K. lost several steamers through enemy action, while running the gauntlet of the undersea terrors in the Mediterranean, Bay of Biscay and the Irish Channel, carrying food supplies and war materials to the allied armies. Critics overlook that the N.Y.K. carried its full share of the load imposed upon it and maintained a regular fortnightly European mail service during all the dark days of the war, and together with their escorts in the Japanese navy lived up to the highest traditions of those who instructed them in the art of modern seamanship. The spirit of the British navy and mercantile marine found its counterpart in the navy and mercantile marine of Japan. While the new European line steamships of the N.Y.K. cannot be compared to the larger ocean greyhounds in size, speed or luxury, past experience has taught that they are the most economical in the long 12,000-mile run from Japan to Europe loading at three ports and discharging



Plan of the N.Y.K. T-class 10,000-ton Geared Turbine Freighters built for the European Service



"Fushimi Maru"



"FUSHIMI MARU" CLASS OF N.Y.K. PASSENGER AND CARGO STEAMERS

Particulars: 505'-0" × 63'-6" × 37'-6" moulded; two deck type; 2 Triple-expansion engines; 7 Boilers 15'-6" × 11'-9" × 200-lbs. pressure; Water ballast 2,275 tons; Cubic capacity 595,240 cft.; Total bunkers 2,200 tons; 12 Steam winches; Gross tonnage 11,900 tons; Deadweight 12,000 tons; Speed 164 knots

PASSENGERS: 1st class, 121; 2nd class, 60; intermediate and 3rd class, 190

passengers and cargo in six or seven. Other points other than mere size had to be considered in the design of steamers on such a long and varied run. The European service of the N.Y.K. was opened in 1896 with a monthly service of cargo and passenger vessels, and then fortnightly as soon as new 6,000-ton vessels were built in England. In 1911, the original steamers were gradually replaced by six of the *Kamo Maru* class of 8,300 tons, and in 1913 these were superseded by five steamers of 10-12,000 tons. Besides the regular mail services the N.Y.K. has regular cargo services between the leading European ports and the Far East. During 1921 no less then 51 vessels were dispatched, an average of one a week.

In other words, the company is keeping abreast with the requirements of trade and the traveling public and its phenomenal success is due largely to the support of its friends in many lands.

#### The "Hakone Maru"

The three new vessels (of which the *Hakone Maru* was the first to be put on the run) have all been constructed at the Mitsubishi yards at Nagasaki to meet the requirements of the Japanese government and the highest class in Lloyd's register.

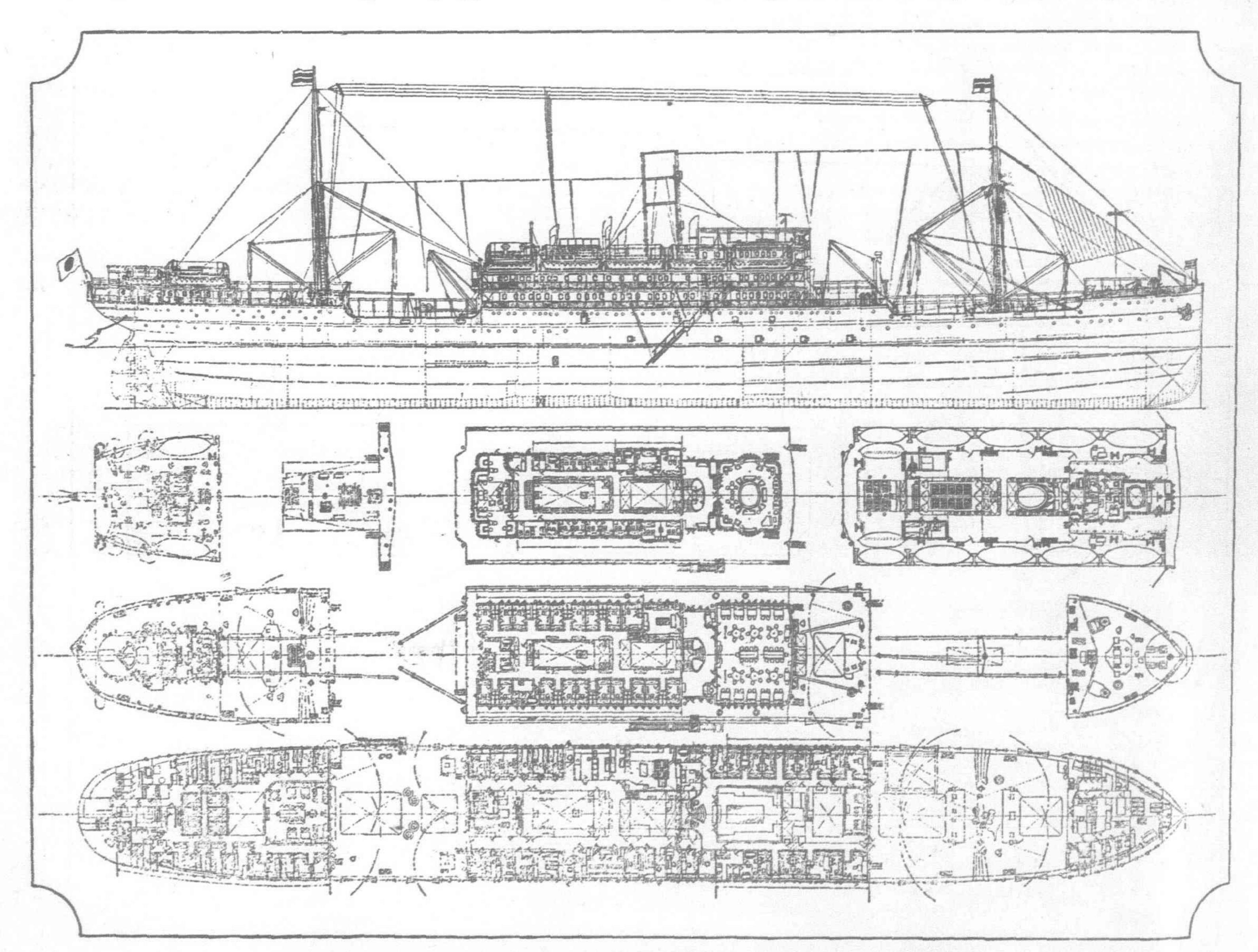
Launched on July 25 last, the dimensions of the *Hakone Maru* are: Gross tons, 10,422; dead weight, 10,861; displacement, 18,500; length, 495-ft.; breadth, 62-ft.; depth, 37-ft. The vessel has a double bottom throughout fitted for the carriage of oil in bulk, is divided into eight watertight compartments, is equipped with wireless, and the latest fire extinguishing apparatus and dis-

infecting appliances. The boat equipment is in excess of the board of trade requirements, all lifeboats being placed under davits.

Her accommodation is for 120 first-class, 56 second-class, and 180 third-class passengers. First-class accommodation is provided on the promenade and bridge decks, and consists of suite rooms, single berth cabins, and spacious and well-appointed two and three-berth cabins. The public rooms include social hall (or drawing room), smoking room, verandah café, children's room, and gymnasium. The second-class accommodation consists of two and four-berth rooms on the main and poop decks, with spacious dining saloon and comfortable smoking room. Hair-dressing saloon and laundry are available for passengers.

All the latest devices for the rapid handling of cargo are fitted, including 18 steel cargo derricks, one heavy derrick to lift forty tons, and 18 steam winches. The holds are spacious with extra large hatches, and have, as far as possible, been kept clear of obstruction to permit the loading of bulky cargo. A limited space is fitted with refrigerating machinery for the carriage of chilled or frozen produce. The propelling machinery consists of two sets of Parsons double reduction geared turbines constructed by the builders, steam being obtained from seven single-ended multitubular boilers, fitted with Howdens forced draught, designed to give a sea speed of 16 knots, which was exceeded on trials.

Whether forced by the competition of the larger and swifter U. S. shipping board and the new Canadian Pacific steamships on the transpacific run or merely as a return to pre-war conditions,



"KATORI MARU" CLASS OF N.Y.K. PASSENGER AND CARGO STEAMER

Particulars: 490'-0 × 61'-0" × 36'-6" moulded; Combined reciprocating and turbine engines; 6 Boilers, 15'-6" × 11'-9" × 200-lbs. pressure; Water ballast 2,072 tons; Cubic capacity 595,240 cft.; Total bunkers 1,900 tons; 12 Winches; Gross tonnage 10,600 tons; Total Deadweight 10,900 tons; speed 16½ knots.

Passengers: 1st class, 112; 2nd class, 56; European steerage, 178; 3rd and intermediate class, 8

the N.Y.K. have now concentrated all their crack passenger vessels on the European service. In addition to the three new boats above mentioned there are now on this run the Fushimi Maru, 10,928 gross tons, Suwa Maru, 10,672, Kashima Maru, 9,908, and the Katori Maru of 9,847 gross tons or seven 10,000-ton passenger steamers and four of the 8,000-ton class, viz., the Atsuta, Kitano, Kamo and the Mishima Maru, a total of eleven first-class mail and passenger steamers maintaining a regular fortnightly service between Yokohama, Marseilles, London, Antwerp by way of the usual intermediate ports.

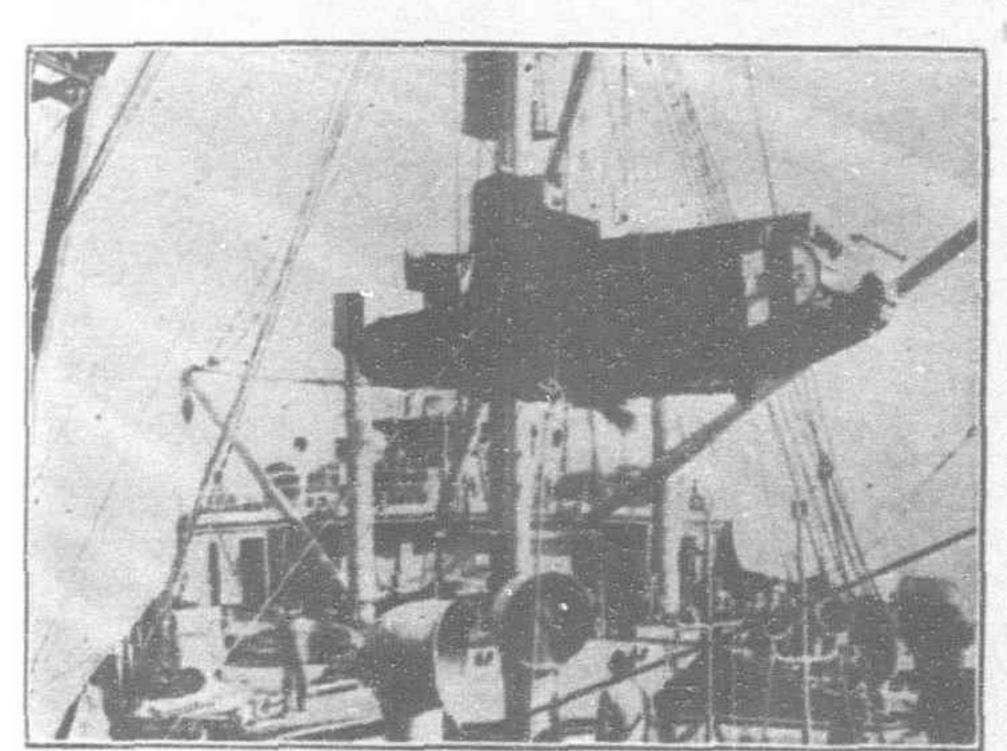
#### N.Y.K. Turbine Freighters

special geared turbine cargo steamers of 10,000 tons deadweight capacity placed in operation soon after the outbreak of the war. Typical of this class are the Toyooka Maru, Toyama Maru and the Toyohashi Maru known as the T-class cargo steamers.

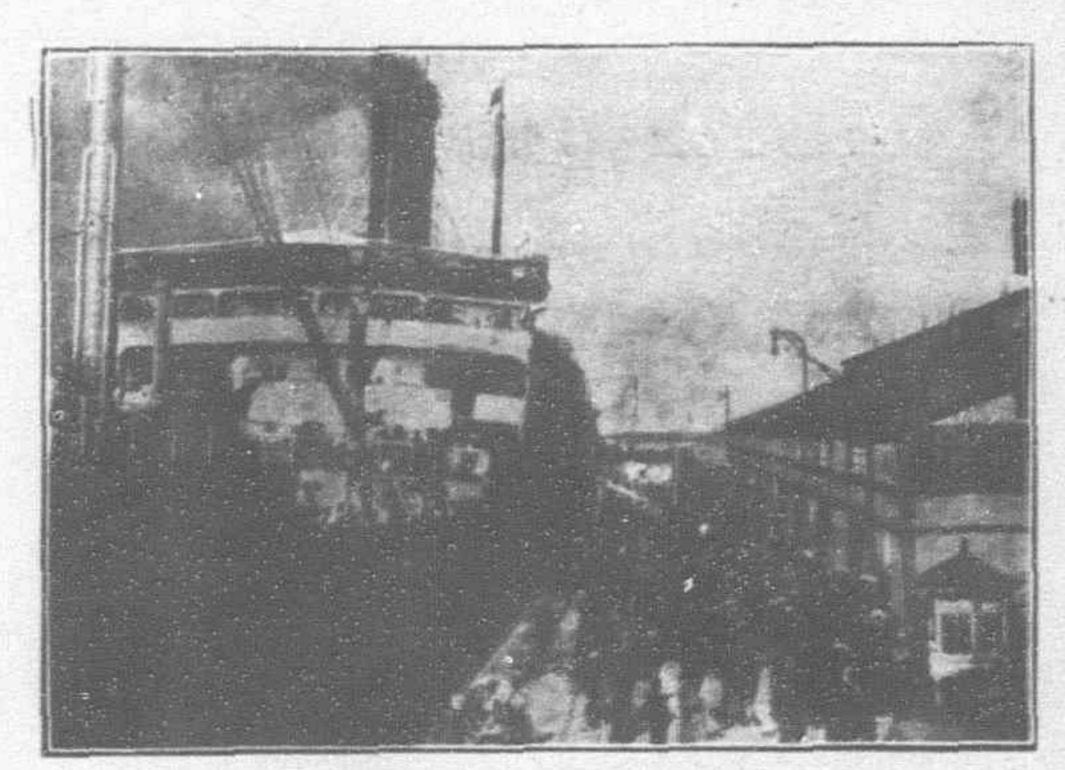
The first two boats have twin-screw geared turbines while the Toyohashi Maru has twin-screw triple-expansion engines with superheaters. The Toyooka and Toyama Maru were built and engined by the Mitsu Bishi Dockyard & Engineering Works, Nagasaki, and the Toyohashi by the Kawasaki Dockyard Company, Kobe. The Toyooka is of the following dimensions:-

The vessel, built to take the Teishinsho firstcl ass under the shipbuilding encouragement act and Lloyd's 100 Al rating, is of full scantling type with erections, having a forecastle 34-ft., bridge 138-ft., and poop 35-ft. long. There are five holds with seven hatches, Nos. 2 and 5 holds having two hatches each. Fifteen steam winches made by the Mitsu Bishi Co., supply the cargo handling apparatus, together with 14 ordinary type derricks to lift 3, 6 and 10 tons, with a 30-ton heavy type of derrick at No. 2 hatch. The propelling machinery consists of two sets of Parsons' geared turbines to drive two lines of shafting. Each gear wheel is driven by a pair of turbines; one, situated on the inboard side, is high-pressure, and the other on the outboard side is low-pressure. One of the features of the N.Y.K. European services is the A reversing turbine is fitted in the exhaust casing of the lowpressure turbine. Each turbine shaft is connected to a driving pinion by means of a flexible coupling. The pinion is geared to a wheel, which is directly coupled with the propeller shaft. The gear ratio is 21 to 1. The turbines are of Parsons' improved type. The ahead turbine is of reaction and the astern turbine of impulse reaction type. They are designed for the working pressure of 200-lb., and for the maximum revolution of the main shaft at 120 r.p.m. The sizes are as follows:

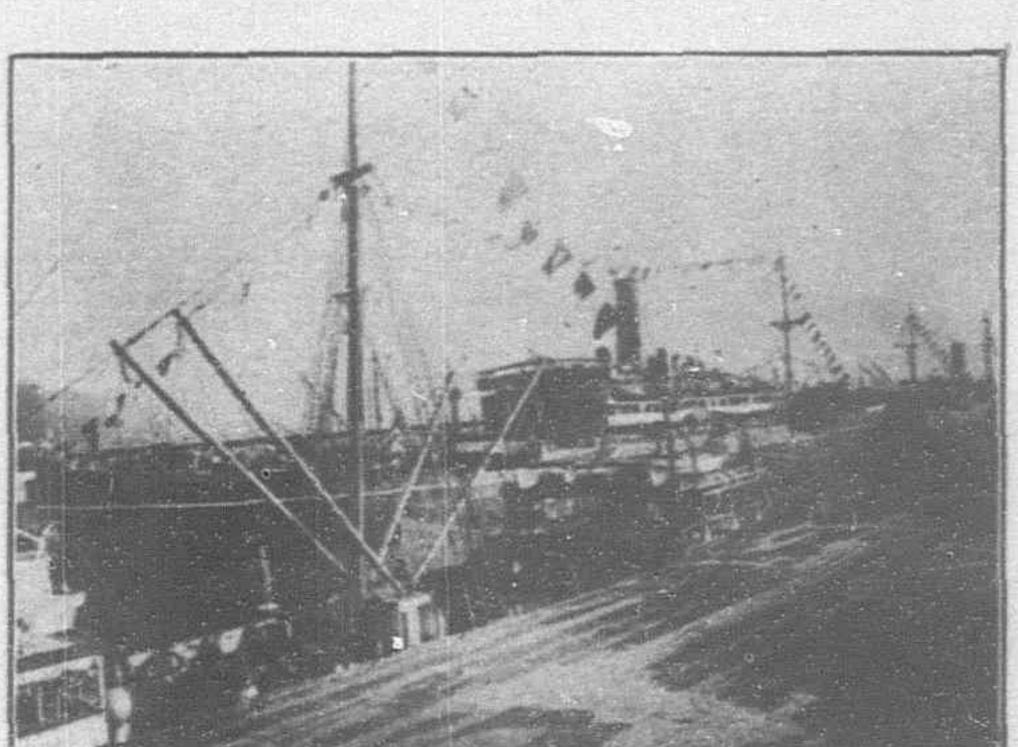
Diam. and 1-ft.  $2\frac{1}{2}$ -in. x 4-ft.  $10\frac{1}{2}$ -in. L.P. Astern length 1-ft. 11-in. x 2 ft.  $5\frac{1}{8}$ -in. 2-ft. 6-in. x 3-ft. 4-in. 1-ft. 11-in. x 1-ft. 11\frac{1}{2}-in.



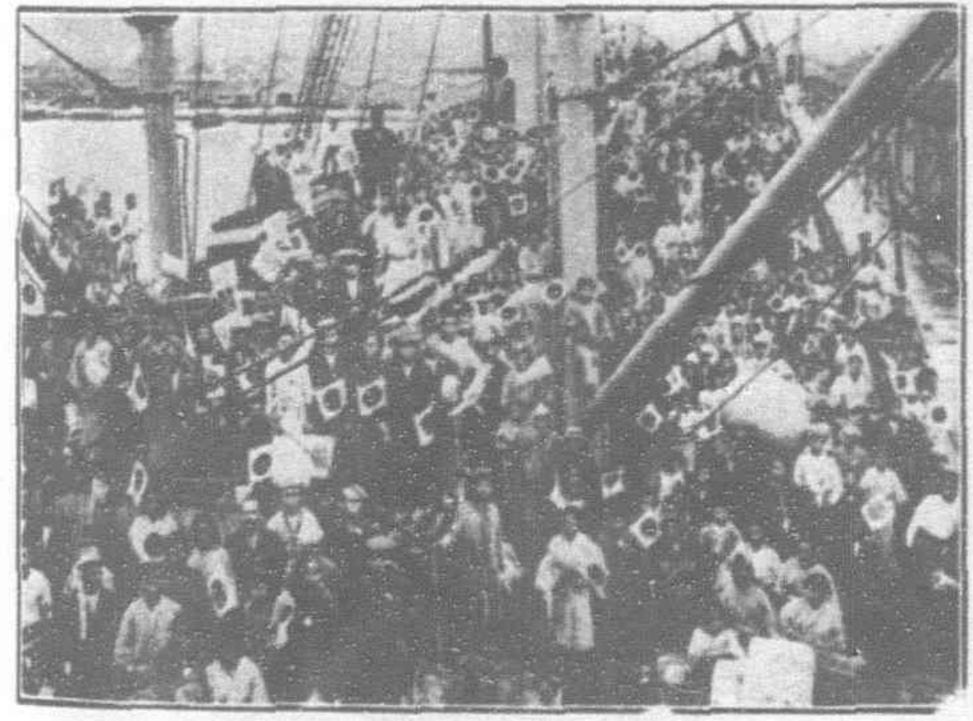
Landing a Tank



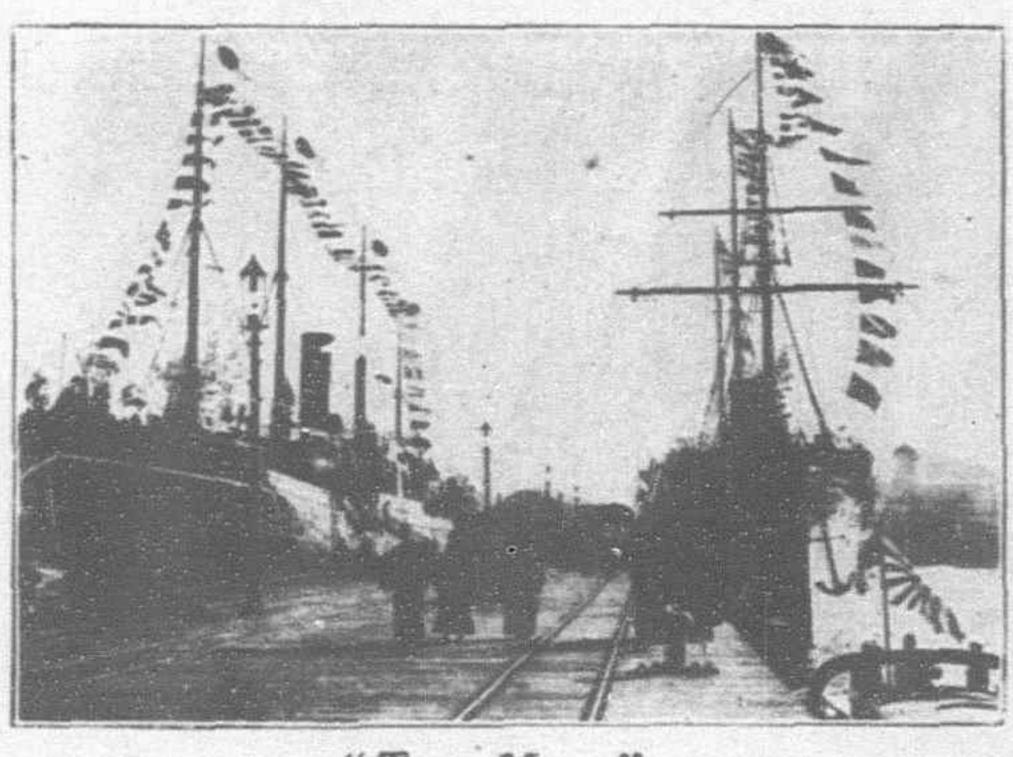
Dock at Yokohama



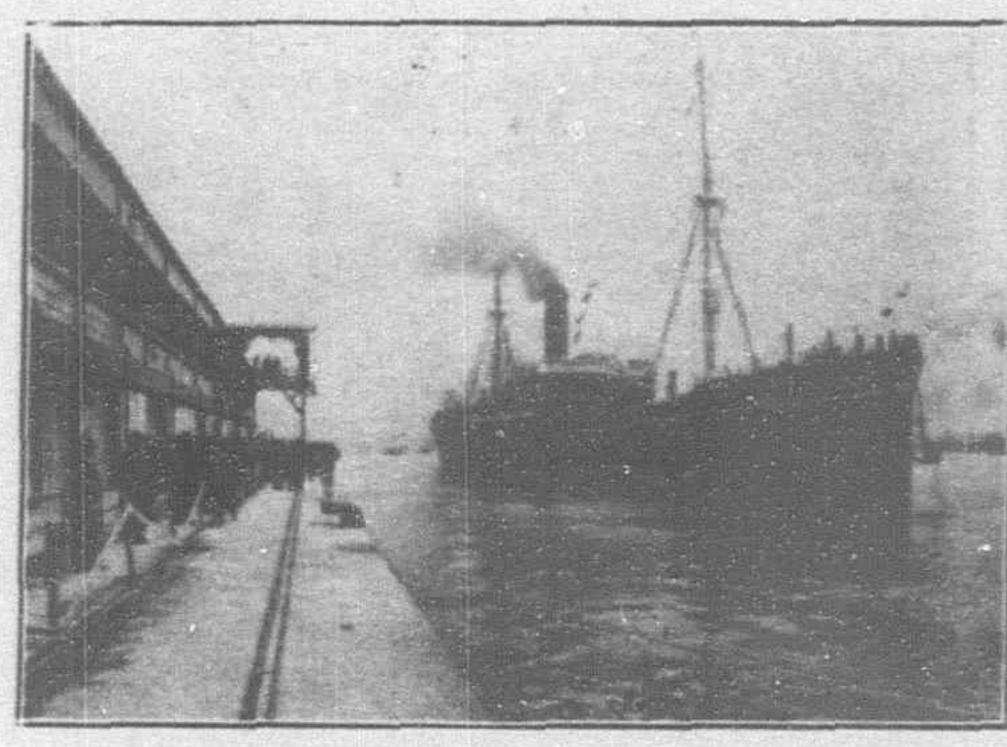
Great Northern Dock at Scattle



"Wakasa Maru"



"Tosa Maru"



"Tamba Maru"

Length o.a			463-ft. 6-in.
" b.p. ·			445-ft.
Breadth, moulded			58-ft.
Depth, moulded to up	per de	ck	34-ft.
" to 2n			23-ft. 9-in.
Maximum draft			26-ft. 8-in.
Gross tonnage			7.375 tons
Net tonnage			4.595 tons
onderdeck tonnage			6,574 tons
Deadweight carrying	canacit	v	10,650 tons
Trial speed			14.54 knots at 9,650 tons displacement
Shaft horse-nower			5 222

all norse-power Height of 'tween deck .. .. 10-ft. 3-in. "bridge " ... 8-ft. " " (clear) .. .. 7-ft. 3-in. Depth of hold (clear) .. .. 20-ft. 1-in. Height of 'tween deck (clear) .. 9-ft. 6-in.

There are four single-ended Scotch boilers of 14-ft. 3-in. diam., 11-ft. 6-in. length, working at 200-lb., with Howden's forced draught. The oil pumps and oil-cooling pumps consist of three independent simplex pumps with complete oiling arrangements for turbines and gearings; among them two are for ordinary working and one is for auxiliary purposes. There are two oil-cooling pumps of simplextype. There are two main condensers and one auxiliary condenser of the non-vacuum type, having sufficient capacity to condense exhaust steam from windlass, winches and all auxiliary machinery. Other equipment includes two centrifugal pumps for circulating water, three feed pumps, feed water heater, cascade tank for feed water filtering, sanitary pumps, general service pump (duplex type), ballast pump (duplex type), two bilge pumps to each gear wheel casing, 40-ton Morrison evaporator, turning engine, turbine lifting gear complete, and two sets of kinetic air pumps, one of them being for reserve purpose. The dynamo of 15 kw. capacity is driven by a reciprocating engine. The propellers are four-bladed manganese bronze, of the built-up type, having a diameter of 14-ft. 3-in., and a pitch of 13-ft. 9-in.

## The Central Workshops

#### Federated Malay States Railways

HOSE who have not actually paid a visit to the scene can have no idea to what extent the workshops connected with the F.M.S. railway system and situated just outside Kuala Lumpur, on the Batu Road, have developed within the past 17 years, despite the fact that a quarter of that period was occupied by such a crisis in the world as almost to cut the works off from the supply of material essential for upkeep and carrying on.

Prior to 1904 the site of the Central workshops was occupied by swamp, lallang and native quarters, and we well remember visiting the scene at about 6.30 one evening, at which late hour Chinese on contract were working trolleys on earthwork at a run. workshop site and surroundings is 206 acres. Included in this area are a 9-hole golf course, a bowling green, and four tennis courts (three hard and one grass.)

The offices are contained in a well-built, roomy and airy block of buildings, which has had to be added to largely to keep pace with the increases necessitated by the growth of the works. The staff there numbers about 50.

#### Iron and Brass Foundry

The first shop we entered was the iron and brass foundry, where all castings for the railway are made. The whole of the



Erecting Shop, Central Workshops, F. M. S. Railways

We, then, can fully appreciate the change which has come over the scene, for neither swamp nor lallang is particularly impressive. But now, in place of these, nothing is to be seen but a well-drained area containing a large array of vast buildings, an excellent residential quarter, and well-laid out recreation grounds. But perhaps a better idea of the rapid progress made may be gathered if we mention that in 1907 the actual shop area was 21,000 square yards, whereas in 1921 it has grown to 61,000. The area of the total

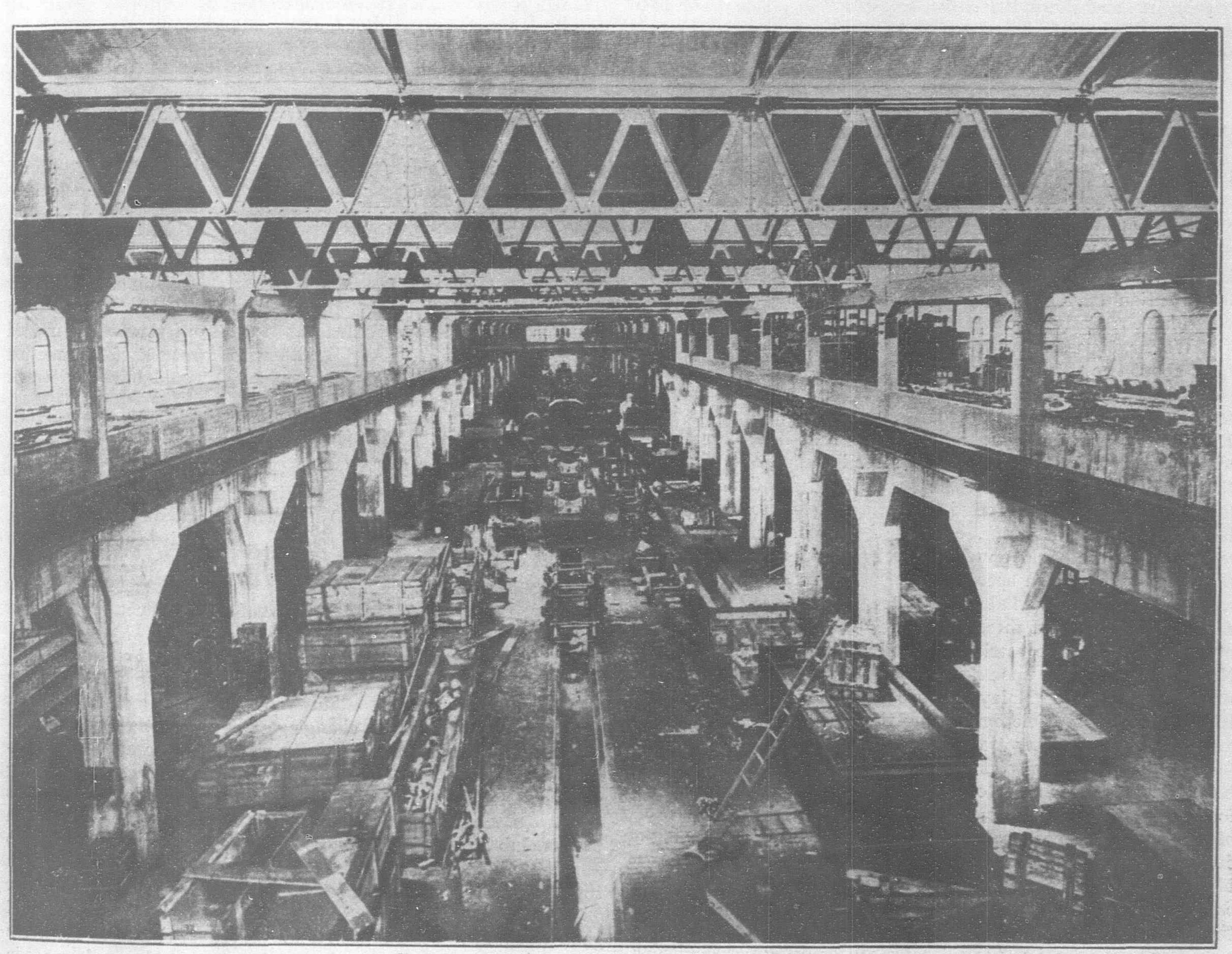
work is carried out by a Chinese contractor, and we were greatly struck by the skill displayed in the preparation of the sand moulds and in the pouring of the molten metal into the imprints left by the removal of the wooden pattern. In the brass foundry we saw the application to brass castings of anti-friction metal, a practise universally adopted to obtain a smoother bearing surface for the axle boxes of rolling stock. In addition to their own work the railway department supply the public works department with

castings. In 1921 the output from the foundry was over 500 tons. Castings of five tons in weight can be made.

The adjoining pattern shop is also interesting, for there much care and skill are employed in making the patterns; while in the upper region of this building is still preserved the old pattern used in casting the memorial tablet placed on the Victoria Bridge at Enggor when it was opened at the linking up of the old Perak and Selangor railway systems.

Passing on, we come to the electrical power-house where one-third of the power required in the work is generated, the remainder being obtained from the Ulu Gombak works. The fuel used in generating is the local Rawang coal, which, it is said, is excellent for the purpose. In this shed, which is kept in spotless order, power can be reduced from 5,000 volts to 400. A group of com-

The next shop visited was originally intended for a waggon shop; but it was never big enough for the purpose; and now it is being used as a store for materials for the building of waggons, a large amount of which is awaiting use as soon as an improvement takes place in trade. Passing out of this building, we came to a broad open track which runs right through the works. In length it is 900 feet, and is known as the "traverser." There, a traveling table on rails is worked by overhead electric power. There are two sets of these rails, and the concrete bed in between forms the main drain and also a road which can be used by the fire-engine attached to the works. Adjoining this is the fine building used for the construction of the railway carriage bodies and concerning this we heard a good story about a past member of the railway staff, who, in his enthusiasm for horse-flesh, suggested that the building in



Erecting Shop, Central Workshops, F. M. S. Railways

pressors close by saw previous service at the time of the construction of the Perak Pass tunnels. Not far from this building stands another one of very large size which is a branch of the stores department for the whole railway system. It is on this department that the works have to draw for supplies, these being indented for in bulk from the general stores of which Mr. Stones is in change.

We next come to a building which was used for building motor vehicles at the time when the railway department was running them; but now it has been turned into a general utility shop. There; amongst other matters, lamp-making and repairing are carried on, and it is typical of the economical working so noticeable throughout the whole institution, that the old and familiar stand-by of the East, the kerosene-oil tin, is brought into service.

question might be usefully employed as a hippodrome. Its length is about 400 feet. At one end is the saw mill, where we saw some very fine machinery employed in various way in cutting up and shaping the woodwork required.

The railway department might almost be considered the pioneers in the use of Malayan timbers. A few years ago teak, chengal, rasak, merabau, meranti and serayah were alone in use but to-day, on the advice of the forest department, such comparatively unknown timbers as ballau, kapur, keruing, kulim, petaling are in addition being freely worked, and teak has been almost entirely eliminated.

In these construction sheds we saw the body being built of a tramcar which is to be run in Penang in connection with the Hill Railway. We may here state, by the way, that the railway department does not make the under-frames of the carriages, but usually obtains them from home; though, during the war, in 1917-18 emergency orders had to be placed in Canada and Japan.

The next place visited was the boiler shop. This is devoted to repairs, which often are very heavy. Bridge and boiler construction work could be and has been, undertaken here; but, as the plates have to be obtained from home it has been found expedient to import boilers complete. The shed has just been extended 200 feet, and is now about 4000 feet in length. Near this, again, is a new waggon shop of 400 feet length. It was originally intended to make this 600 feet but it was found advisable to curtail the size for the time being. This shed, which is not quite finished, contains two bays, each 50 feet wide. Each bay will contain a 15-ton crane running up and down the entire length. The pillars have been constructed of reinforced concrete, as steel has been so high in cost and so difficult to procure.

#### Labor-saving Devices

Next we come to the blacksmith's shop covered by the roof of the old Kuala Lumpur railway station. Here are several steam hammers, one of the largest of which was built in the works.

In this department new springs for rolling stock are turned out and old ones are repaired, tested and brought into re-use. Here as elsewhere we saw a considerable amount of valuable and labor-saving machinery which we are not competent to describe, but mention may be made of two machines for making bolts which have recently been installed.

We next passed on to an other carriage shop. This was built about two years ago and is 660 feet in length, with two bays, each 50 feet wide and equipped with 15-ton cranes. This huge shed is devoted to the work of fitting and repairing carriages. Everywhere we went we found the work most interesting but it was especially so in this department. For instance, one of the first things brought to our notice were some carriages that are being fitted up for the paymaster of the railways. These are going to be formed into two trains, each of three carriages. These are regular miniature banks on wheels, designed for paying wages over the whole system with speed and safety. The applicant for pay receives it through a window protected by expanded metal; and as there are several of these windows to each carriage the process of paying out can be carried out rapidly in comfort and safety. Near by this, we came upon a new type of car which, we understand, was exhibited at the Malaya-Borneo exhibition at Singapore. It is an interesting vehicle embodying the very latest ideas of ease and comfort in railway traveling. To achieve this, the central idea is, of course, a bar compartment, where cold tiffins or tea can be obtained; in fact in this one carriage are combined all the comforts of the usual first class, together with facilities for the seating of four people in comfort at a table large enough for the playing of card games. This accommodation is provided both in that part of the car which contained the bar and also in what we may call the ordinary part. This has been found possible by building the sides of the carriage on a new principle, namely, what is described as bent sides, i.e., the sides, instead of being perpendicular, bulge outwards. Similar coaches are now running to Malacca and on the Singapore section. Fans are provided throughout these cars.

In reply to a question we were informed that carriages required to be renovated and re-varnished in from 18 months to 2 years' time.

#### Innovations on Trains

Other matters of interest that we saw were the following. A cupboard with doors opening outwards was fitted in the side of a guards van. This is for the use of the carriage-examiner, who when he needs grease, will now be able to obtain it without plastering the said material over the floor of the van, or, possibly, over luggage. We next saw a room where the electric fittings of the carriages are regraded and in which materials for electric lighting are kept. We

were told that some six to eight stations had been fitted up by the department with small lighting sets, though whether with entire success it is too early yet to say. Passing on, we came to a room devoted to upholstering work for the carriages, and there among other things we saw some ratan seats for the second class which, we were told, were made in England. Needless to say, the management has long since started to make ratan seating in the workshops.

Across the railway line is the engineering depot, which is under the charge of the engineer for ways and works, Mr. R. W. Haim. This, owing to pressure of time, we were unable to visit; but on our way back we passed through the erecting shop, a building now 600 feet long, and containing three bays, the central one being 45 feet wide, and those at the sides, 40 feet. Two 20-ton cranes are in operation here, while an electrical shop is installed upstairs. Though several times extended, this shed, we were told, is still too small, and the question of building a new shed on a new plan is under consideration. The machinery in this section is very fine, especially the numerous lathes. Among the many items of interest is a hydraulic press with a pressure of 200 tons. By means of this, wheels are put on the axles at about 70 tons pressure. The system of group driving by means of electric motors is adopted in this shed, but the bigger machines are individually driven. Turret lathes—so much in use at home during the war—are among those installed in this department.

In reply to a question as to whether the workshops turned out any work for war purposes we were informed that our authorities had offered to make huts which could be shipped in sections ready for speedy erection but the offer had been declined. This seems a pity for we could have turned out this, at one time much needed work, rapidly and cheaply. Munition work was out of the question here owing to the fact that the material would have had to be brought in and shipping was scarce.

#### Staff and Hours

The staff employed in this great undertaking varies from 1,300 to 1,400 all told. The working hours for the laborers are: 6.30 a.m. to 11 a.m.; 12.30 noon to 4 p.m. on ordinary days, on Saturdays 6.30 a.m. to 12 noon. Pay is given for 8 hours on Saturdays when the workman has not been absent during the remainder of the week. Instruments known as recorders showing the timé of the arrival and departure of the workmen are installed in the works.

Before leaving, we went to seen the railway institute a commodious building of nice design erected alongside the recreation ground. This building contains a fine reading and refreshment room, a billiard room, a changing room, with the usual conveniences, a secretary's room and a store room. In addition to billiards, a ping pong table is provided. The Padang is big enough for cricket, football or hockey while two grass tennis courts and two Badminton courts are also maintained. The subscription to this club is a graduated one based on salary, and both the club and the adjoining playing field are deservedly popular, adding as they do to the pleasure and convenience of those who live near by-

To accommodate the senior staff, some 18 to 20 bungalows of good design have been built in a line on the far side from the works of the golf links, care having been taken to provide ample space in between. In fact it is very evident that in laying the site of what is now a little township, the greatest care has been taken to provide in every possible way for the welfare of the whole staff whether in the works or during their leisure hours.

In conclusion, we can only advise our readers to pay these great works and model township a visit, for we are unable in the course of an article to do them justice. For the rapid strides made and the success achieved, the greatest credit is due to Mr. P. A. Anthony, c.m.g., the general manager of our railways during the past 12 years, and to Mr. G. C. Forbes, the locomotive superintendent, who has charge of all the main portion of the undertaking, and who, coming to the F.M.S. in 1903 after  $5\frac{1}{2}$  years' railway service in India, started these works and developed them into what they are to-day—a monument of energy and enterprise under careful supervision and economical working.—The Malay Weekly Mail.

## New Telephone System for Mukden

NE of the largest Kellogg system-exchanges in the Far East is that of the Manchurian provincial government at Mukden. The first telephone exchange in Mukden, a local battery magneto system, was installed about 1910 with less than 200 subscribers; by 1918 this exchange had grown to its ultimate capacity, 800 stations. The equipment was in poor condition and the administration found it impossible to furnish satisfactory service.

In order to improve the service and, at the same time, to make possible further extensions to take care of over 100 merchants who were clamoring for telephones, the director of the administration requested several manufacturers to submit specifications and samples of their apparatus.

The Kellogg universal switchboard was selected as best meeting the requirements, and an order was placed with the Kellogg Switch-

board & Supply Company, through their China Agents, Messrs. Andersen, Meyer & Company, for central office equipment having initial equipment for 2,200 lines, and an ultimate capacity for 3,200 lines.

operate either magneto local battery, or common battery telephones in connection with the Kellogg universal switchboard. The Kellogg universal line circuit consists of a standard common battery lamp signal line circuit with the addition of an extra contact at the line relay. In order to change a line from

magneto to common battery, it is only necessary to change one connection on the relay terminal. The changed circuit is then a standard common battery line circuit exactly the same as would be furnished in a straight common battery switchboard equipment. The connecting cord circuits automatically adapt themselves for connections from magneto to magneto; magneto to common battery; and common battery to common battery lines.

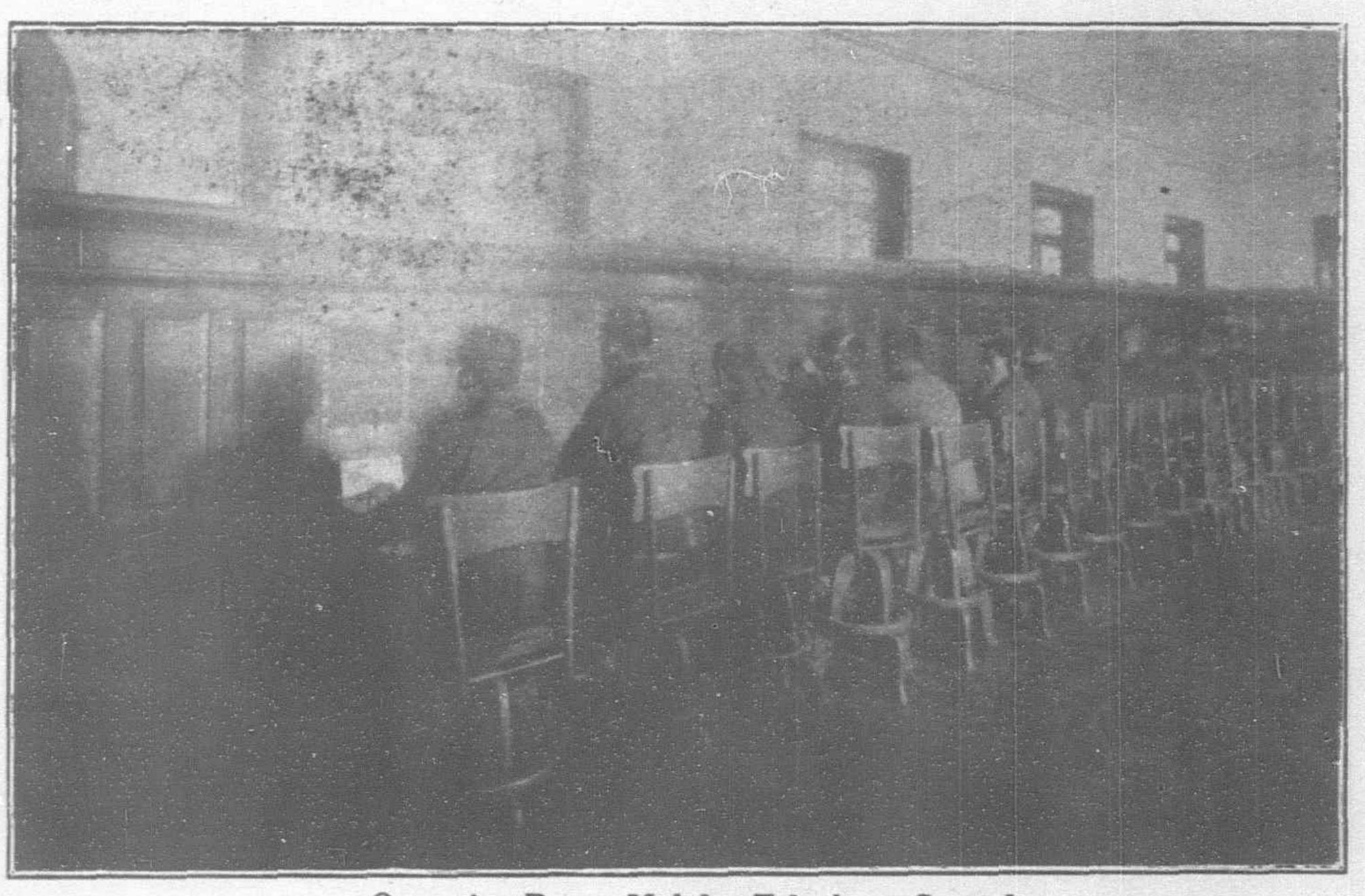
The new Mukden exchange was placed in service during the summer of 1920. The 800 magneto local battery subscribers were connected with their old telephone sets to the new Kellogg universal switchboard. No change in the instruments was necessary.

At the time the new switchboard was placed in service, the administration announced that Kellogg common battery telephones would be installed for any subscribers who desired common battery service, upon the payment of a deposit, and at a small increase in the monthly rental. Immediately applications began pouring in for the Kellogg telephones, and within one year, the original 800 stations were changed to common battery, and 400 new subscribers were added to the exchange, making a total of 1,200 stations. By this time the line cables were filled to capacity. The administration recently placed orders for wire, cable and telephones, sufficient to take care of 500 additional subscribers.

The telephone administration erected a modern fire-proof one storey and basement building to house the central office equipment. All of the apparatus was installed on the ground floor. The terminals, relay racks, wire chief's desk, charging and ringing motor-generators, power panel, etc., are all in one room—conveniently arranged for maximum efficiency. The universal switchboard and chief operator's desk is in a large room on the same floor. Two sets of storage batteries are located in a dry and well-ventilated basement room. A gas-engine generator charging set is located in a basement room. This is furnished as an insurance factor against possible failure of the city power plant which regularly supplies current for operating the charging and ringing generator.

The line cables enter the office through a tunnel which connects the basement to a terminal house near the cable pole. All of the work of installing the equipment was performed by Chinese

"Fitters" regularly employed by the administration. A glance at the accompanying illustrations is proof that they did their work well. The exchange has now been in service 18 months, in charge of the same Chinese foreman who operated the old magneto equipment. This man is not an engineer, and had no previous experience with common battery equipment. The Mukden telephone service is highly satisfactory to the subscribers, and one does not hear in Mukden the complaints that elsewhere in voiced China.



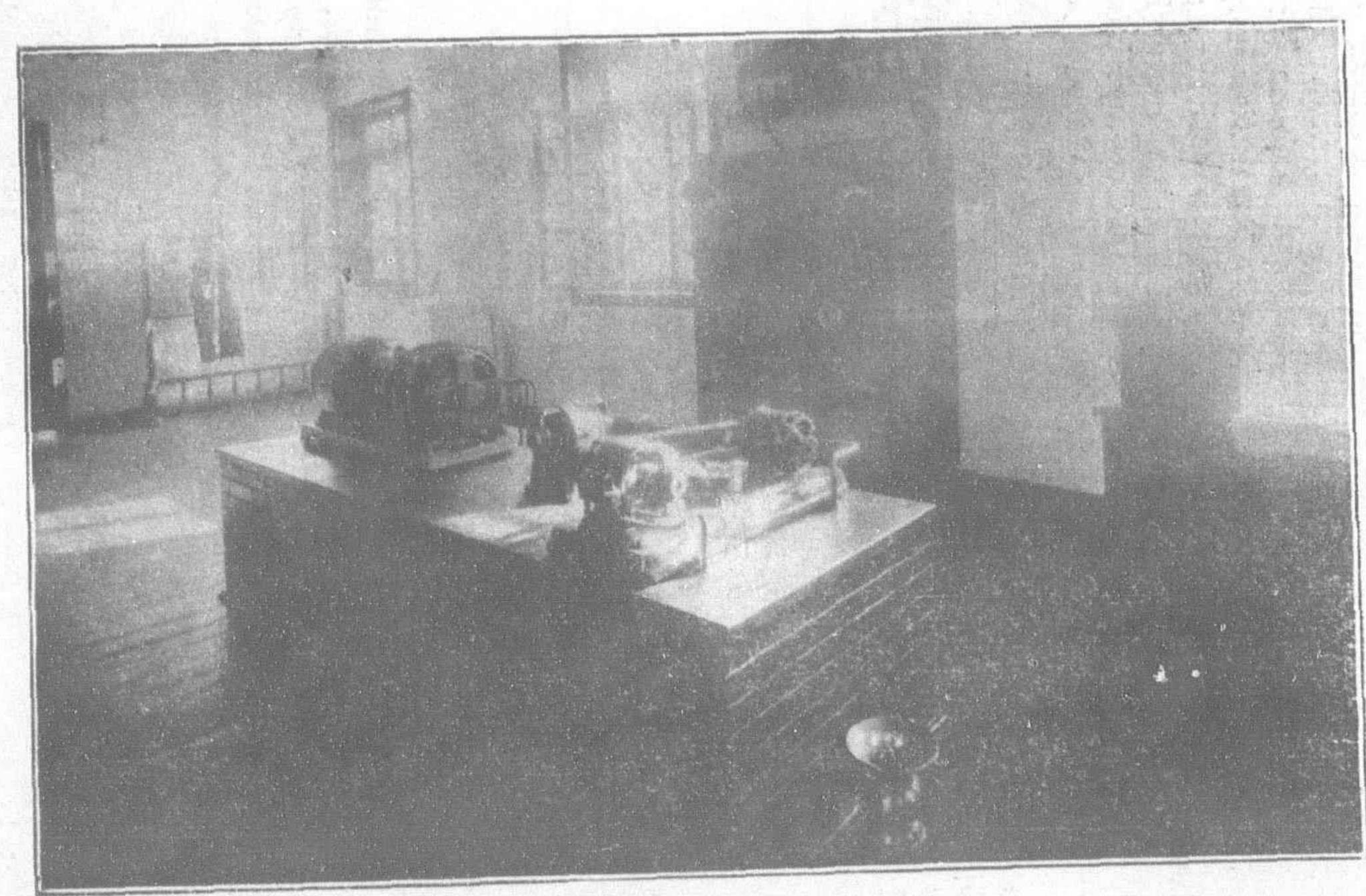
Operating Room, Mukden Telephone Central

Gas and Steel Works at Tsurumi.—A gas plant and steel works will be started at Tsurumi soon, with a large daily output of steel and a daily capacity of 2,000,000 cubic feet of gas, according to the Japanese vernacular press. Mr. S. Asano, president of the Toyo Kisen Kaisha, has bought out the coke factory of Mr. T. Yamamoto, ship magnate of Kobe, and machinery for the new factory has already been contracted for.

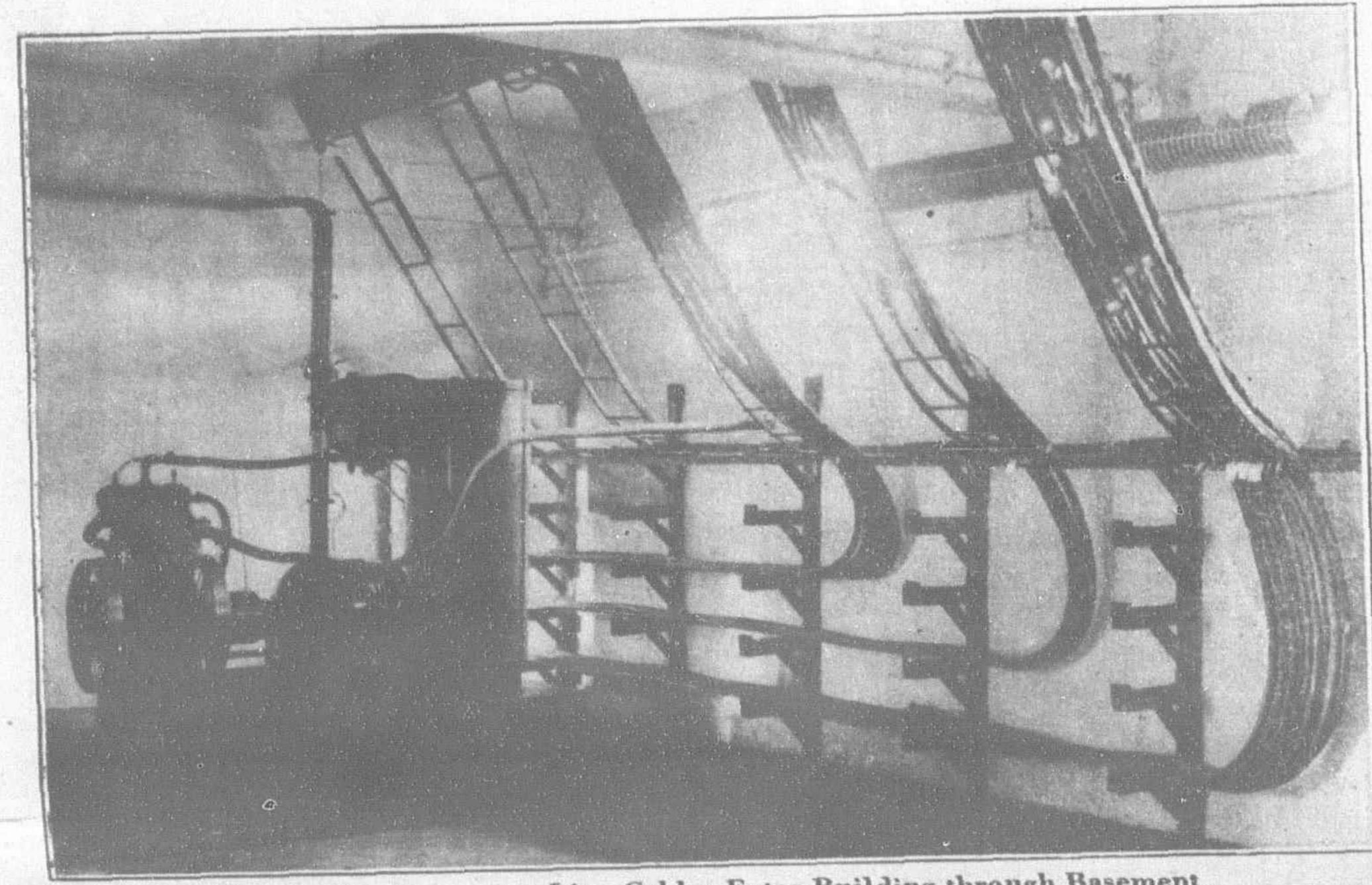
This factory will be one of the first of its kind in Japan where the manufacture of steel and gas will be combined. It is intimated that a contract has been made with a gas company in Tokyo to furnish illuminating gas from the Asano works.

South Manchuria Spinning Mill, Ltd.—Architects entrusted with the drawing up of a plan for the new spinning mill to be erected by the South Manchuria Spinning Mill, Ltd., have arrived at Fengtien (Mukden) from Japan. This Company has secured from the S.M.R. Co. the lease of a tract of land comprising about 15,000 tsubo on the west side of the railway track at Mukden, and proposes to begin building work in early July at the latest, to be finished by the end of October. The total cost is put at about Y.300,000. The new plant is expected to be opened to operation about May next year.

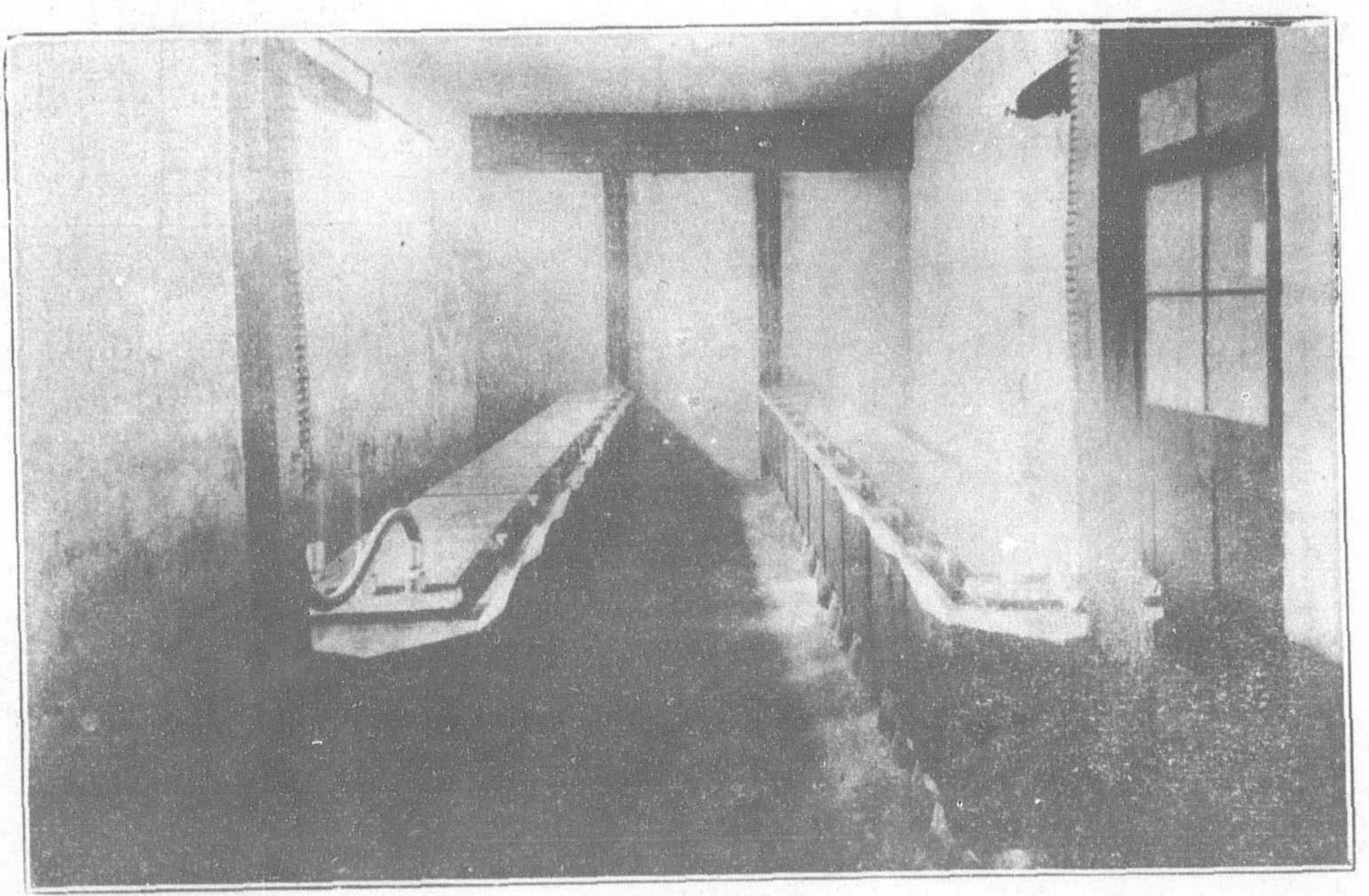
# NEW KELLOGG UNIVERSAL SWITCHBOARD, 3,200 LINE INSTALLATION FOR THE MUKDEN TELEPHONE ADMINISTRATION



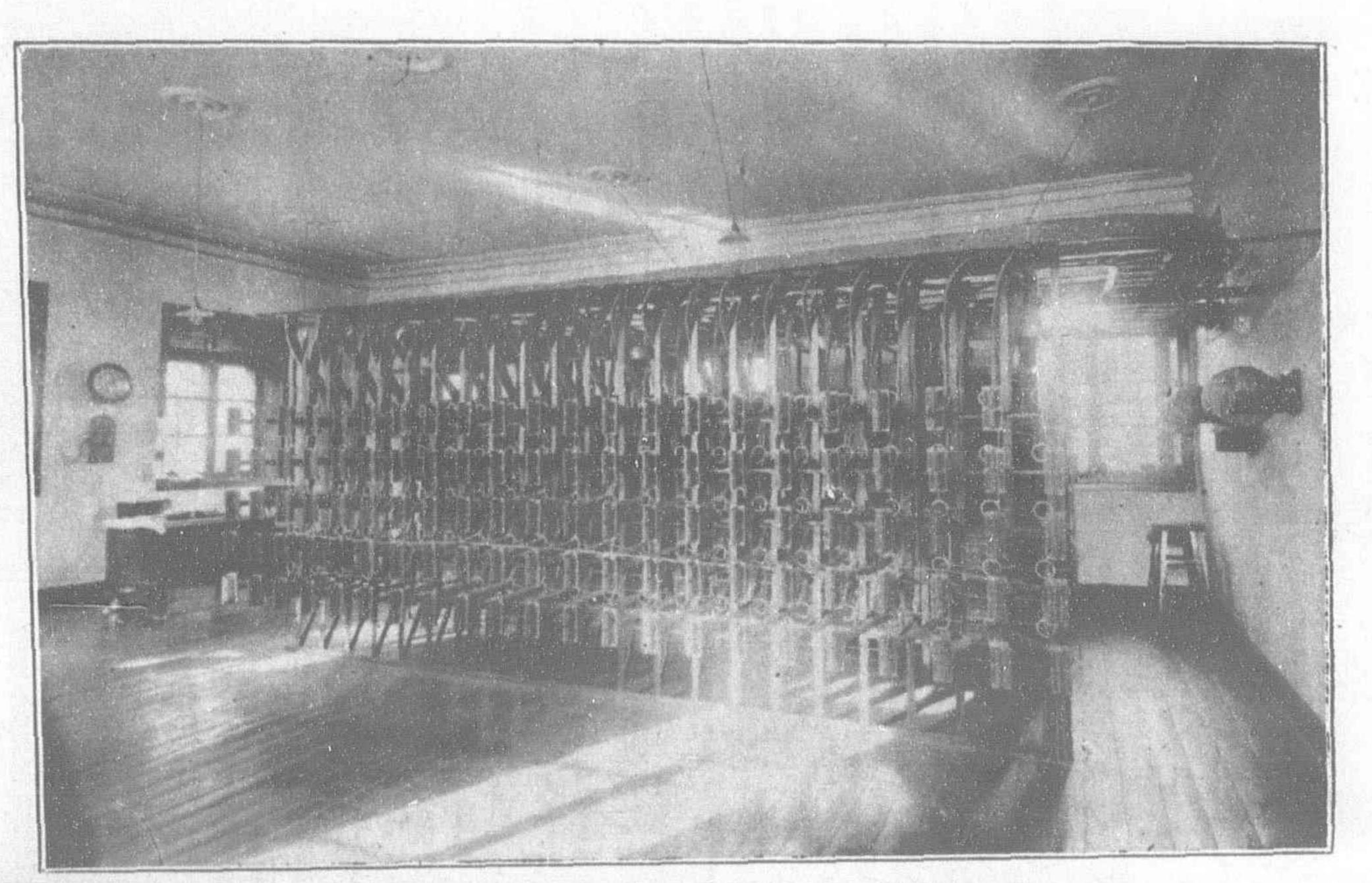
Power Apparatus and Wire Chief's Desk



Gas Engine Generator, Line Cables Enter Building through Basement



Battery Room



Kellogg-Terminal Room: 3,200 Line Equipment

minaries.

## Tayeh and Its Industries

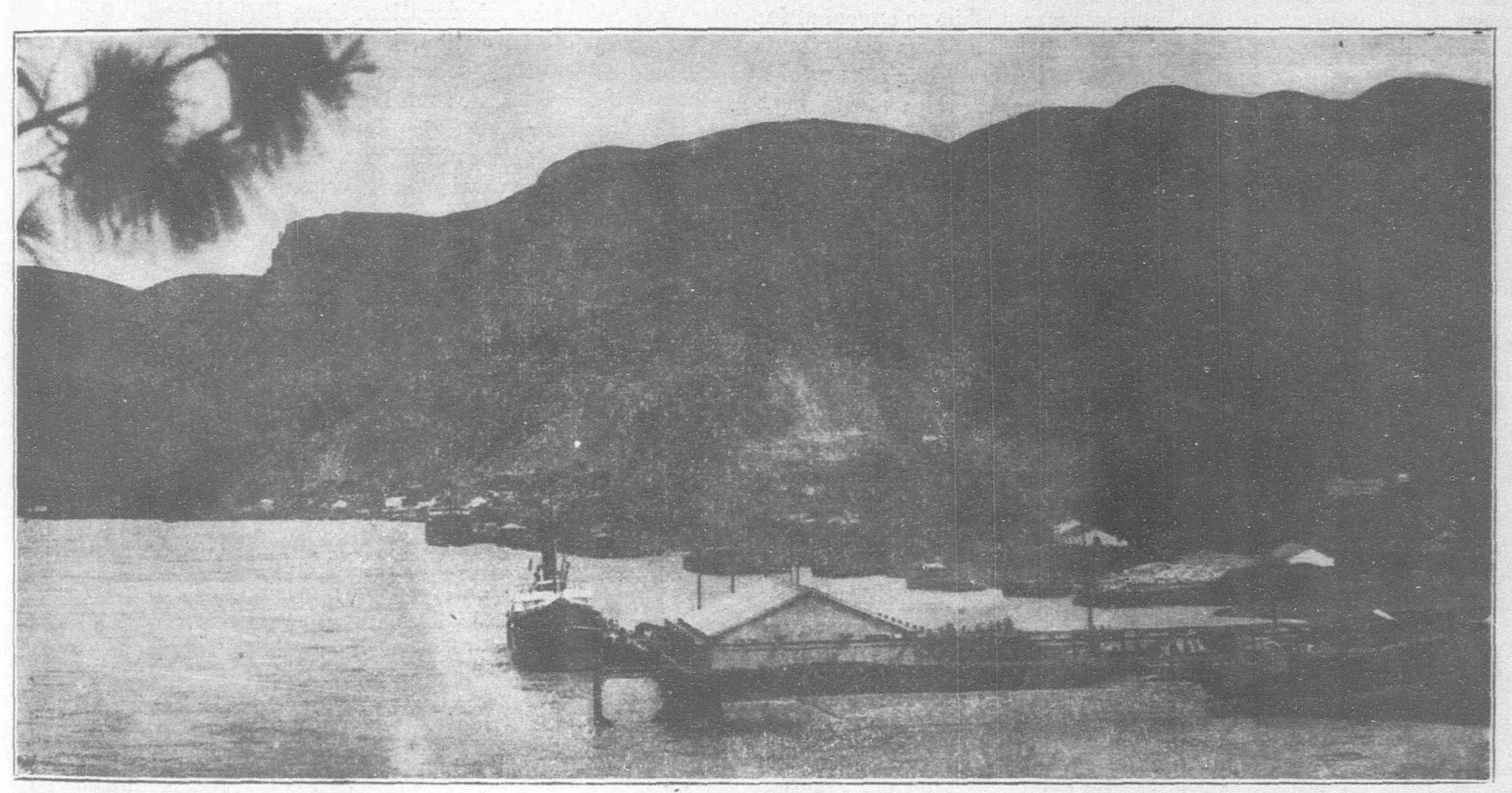
China's Half-way Policy

HE Chinese have a saying "pan tu erh fei" which means "to go half the way and then fail to go further." Failing half-way is a common kind of failure in China. "This man began to build and was not able to finish" was said 1,900 years ago and is as true as ever, especially in this land. In this Tayeh region we seem to be accorded more than our share of this kind of thing. There is a place about 15 miles from here called Wangshanshih (facing mountain stone). It was prospected by no less than three engineers from Glasgow. A million dollars were spent by Chang Chih-tung over these preli-

A little mining was done and the prospect was a fair one but somehow or other the enterprising spirit exhausted itself at that point and the scheme was abandoned. There is now only a big hole to show for the expense. There is a mountain about seven

I took a small steamer from there to Shihkweiyao. This we are given to understand is to be a port of considerable importance. It has been the river side terminal for 30 years for the railway to the iron mountain. There is always a Japanese steamer moored here ready to take iron-ore to Japan (or to a dump at Wuhu when the river is too low for big steamers). Japan gets this iron on special terms in payment of the Boxer indemnity. Other steamers tow lighters of ore up to the Hanyang Ironworks.

A few years ago a great enterprise was started just below Shih-kweiyao. A huge plant has been collected and blast furnaces are to be opened there to relieve the pressure on Hanyang. The dates that I have heard given for opening the new furnaces are more numerous than I can remember. It is always a few months later. Meanwhile there is a model town with wide streets and rows of well-built houses of three qualities according to the grade



TAYEH HARBOR

miles from here to which a light railway was constructed and mining begun. They say that mountain contains the "Wu Pao" (five precious metals), viz., gold, silver, copper, tin and lead.

About three years ago the mining ceased. The railway track still remained; we used often to walk along it. Pedestrians in abundance go along there. One would have thought it would pay to run trains for them and their loads. But no such idea seems to be in anyone's mind. Now within the last three months the rails have been taken up—transported, we are told, to Elephant's Nose mountain, the latest enterprise of the Hupeh government.

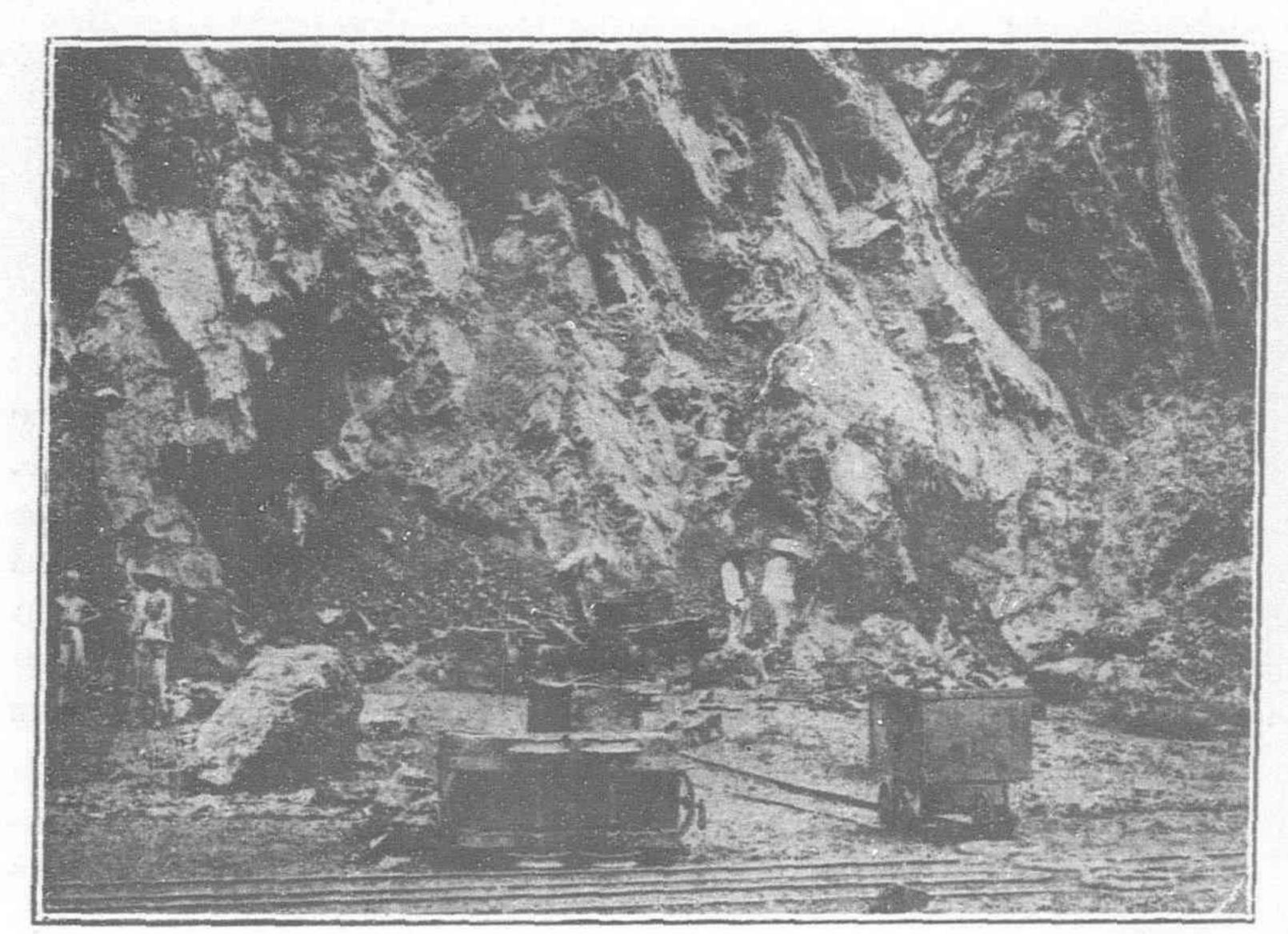
On my last journey I had some more instances of this kind of ineptitude. In the Hsingkuo (now called Yanghsien) county there is another light railway with no traffic on it. It was to convey copper-ore to the river side whence it could be transhipped to Futzukou where there is a copper foundry. I saw this place too. A few men are in charge of it but the Japanese manager was dismissed two years ago and there is now nothing doing.

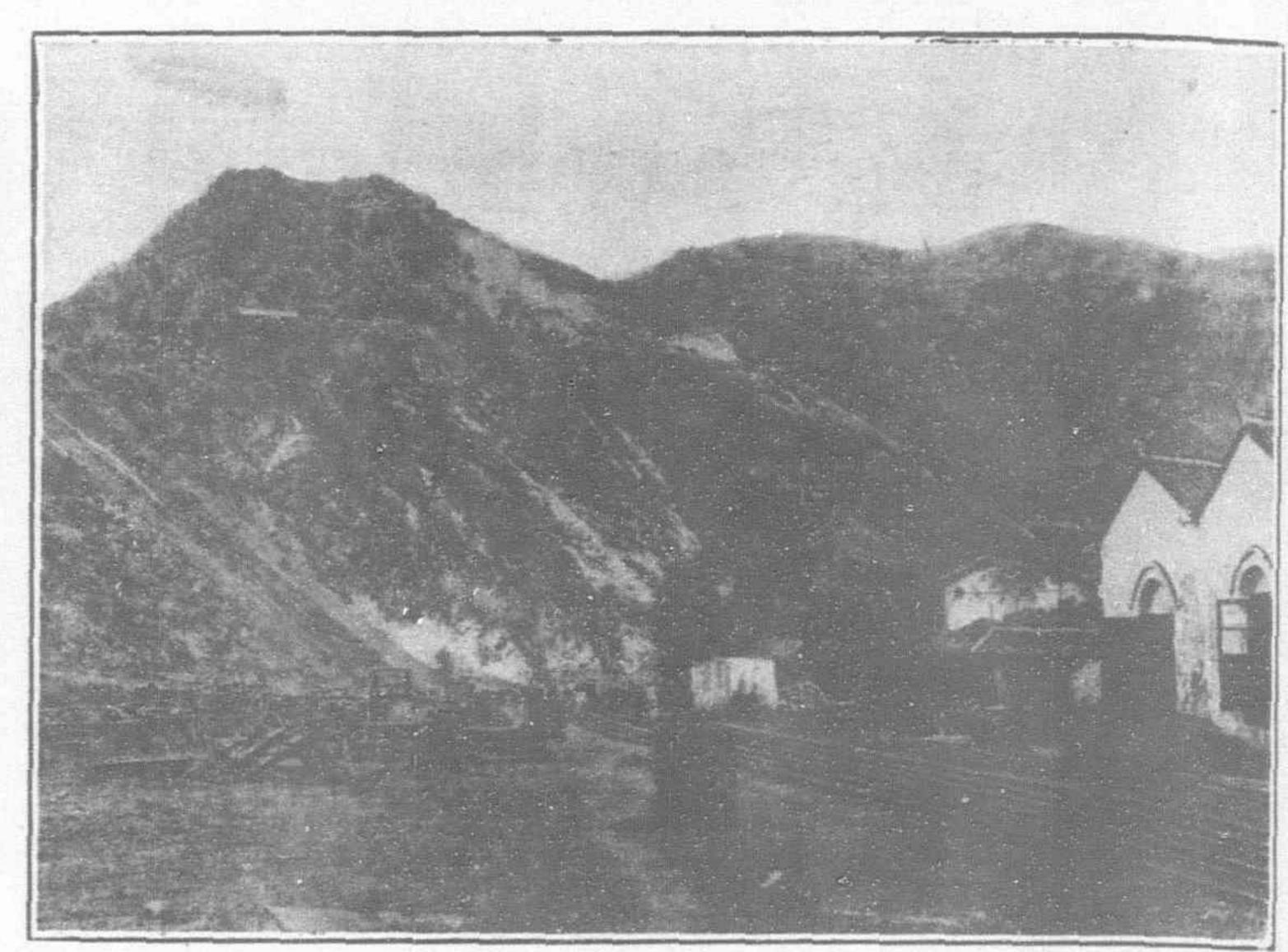
of occupier. A bund has been made for some distance and is to be extended. A fine club house exists and is well patronised. Electric light is supplied to every house and water too.

But the enterprise is halting. Not only has the first blast furnace still to be opened, which means that nothing has yet been produced to pay the promoters, but we hear of economies being effected in various ways. One of the two big mines is now closed and the trains run now to the other and newer one. The fine hospital which—quite rightly—was got ready in case of accidents had two foreign trained doctors. It now has only one. It looks as if the opening of those furnaces, in spite of a very large stock of coke which has been accumulated, is still a good while off.

#### A Line that Tells a Tale

Two or three years ago the Hupeh government opened a mine at Hsiangpishan (elephant's nose mountain). The railway runs alongside of the aforesaid Hanyehping line—sometimes 5 li apart,





TAYEH IRON MINES

sometimes almost touching. Yet they never quite touch. There could be no transfer of rolling stock from the one to the other. The construction of the line was a marvel of speed—only six months, I am told. The chief engineer was a Chinese educated in the U.S.A. He is now in Wuchang to answer a serious charge and the man below him has got his place. It sounds like a very old tale and no doubt went a long way towards making this undertaking, like the others, a non-paying concern. The terminus of this railway is nearer to Hwangshihkang than to Shihkweiyao.

Hwangshihkang has grown of late. A fine chamber of commerce fronts the river and near to it a new R. C. hospital. What no European can understand is why no decent road has yet been made connecting these two towns. They are only 10 li apart; yet there is only a footpath, winding and muddy, to bear the enormous traffic that passes along it on fine days. On wet days the traffic necessarily dwindles to almost nil. Why should not a road that would suit ricshas and bicycles at least be considered a fit object on which to expend money by those who can erect an almost palatial chamber of commerce.

The lime-kilns at Shihkweiyao still do a big trade and so does the Hupeh Cement Works (turning out 800 bags a day) under Danish management. We believe there is still a great future before this Yangtze port. May honesty and commonsense prevail and that result is assured.—C. C. Post.

### Tokyo-Kobe Electric Railway

Yen 67,000,000 to be Expended

THE railway department has completed a draft plan for the electrification of the entire Tokaido railway, between Tokyo and Kobe, the work to be commenced from the fiscal year of 1923-4 and finished in seven years, i.e., 1920-30. The draft, as completed by the committee in charge, is now ready for the minister of railways, Count Oki, to approve for introduction in the diet. The details of the plan are as follows:

The total estimate of the cost of electrification of the line in question will be Yen 67,000,000, which will be expended in annual instalments for seven years, commencing from next year, when it is approved. The cost of repair of railways from the next fiscal year will be over-estimated and the bond policy will be reshaped, so that Yen 20,000,000 will be added to Yen 80,000,000, which was already decided upon by the government under the preceding ministry, to be secured by bond issues.

The greater portion of the cost of electrification will be consumed in building cars, amounting to Yen 35,000,000. There will be nine locomotives built for pulling special express trains, 46 for ordinary express trans, 107 for local trains and freight trains, 48 for express and large freight trains, 81 for shifting, totaling 291.

The unit of cost for building locomotives for special express trains is estimated at Yen 250,000 and for shifting at about Yen 70,000.

As for the plan of operation, since 1929-30 period is aimed at as the period of completion, the capacity to pull freight trains is estimated at 800 tons, passenger trains at 400 tons, so that there will be from 20 to 30 per cent. increase in the capacity as compared with the present.

The number of cars in a train will be increased from nine as at present for the steam trains to twelve or thirteen in the case of electric trains.

The time required in covering the distance between Tokyo and Kobe will be shortened by one to two hours, or in some cases by four hours. The time can be further shortened in future.

The power needed will be direct current, estimated for maximum use of 1,500 volts. Trolley lines are to be built over the present railway line. The power will be secured partly from the Akabane plant of the department after September, this year. The Shinano river hydraulic power plant, which is expected to be completed in 1926, will also supply power, in Tokyo and its neighborhood. The greater portion of power will be purchased from private companies.

Transforming stations are to be built at a distance of fifteen to twenty miles each, so that, for the entire length of 370 miles between Tokyo and Kobe, there will be about twenty-five such stations.

The work will be commenced from both Tokyo and Kobe, the middle sections being deferred until later years.

Whether the railway department will operate electric street car lines in the neighborhood of Kobe, Osaka, Kyoto and Nagoya has not yet been decided, in view of the existing private street car lines. It is, however, anticipated that such enterprise will be entered into by the railway department.

LIUSHUTUN WIRELESS STATION.—The new Liushutun wireless station, at Dairen, has cost Y.300,000 in round numbers. For its site, more than 15,000 tsubo of the old Li Hung-chang fort has been appropriated.

Three steel towers each 800-ft. tall, of triangular shape, have been erected. The antennae consist of over twenty lines. The equipments of the receiving and despatching power rooms and others is said to rank with the Funabashi station in which next to the Iwaki station, is the highest powered in the Orient. Hokkaido, Formosa, San Francisco, etc., are within communicable range. It is said that a message from a station in Germany has become sensitized on the new Liushutun station. Hitherto, foreign wireless have had to be transmitted by telegraph from the Iwaki or the Funabashi station after reaching there by wireless.

## New Concrete Wharves at Singapore

Socony and A.P.C. Equip Malayan Island Stations with Re-inforced Concrete Piers

9

O check the ravages of the pile worm on wooden piers, and to meet the increasing demand for petroleum by oil-burning steamers, both the Standard Oil Co. of N. Y. and the Asiatic Petroleum Co., have built reinforced concrete wharves on their island stations near

Singapore.

The American company's pier was completed last year at a cost of \$175,000 Straits currency, and is situated on the British island of Pulau Sebarok, a leasehold about eight miles from Singapore which the Socony has held for some time. The wharf consists of an approach 10 feet wide, which extends into the sea for 900 feet,

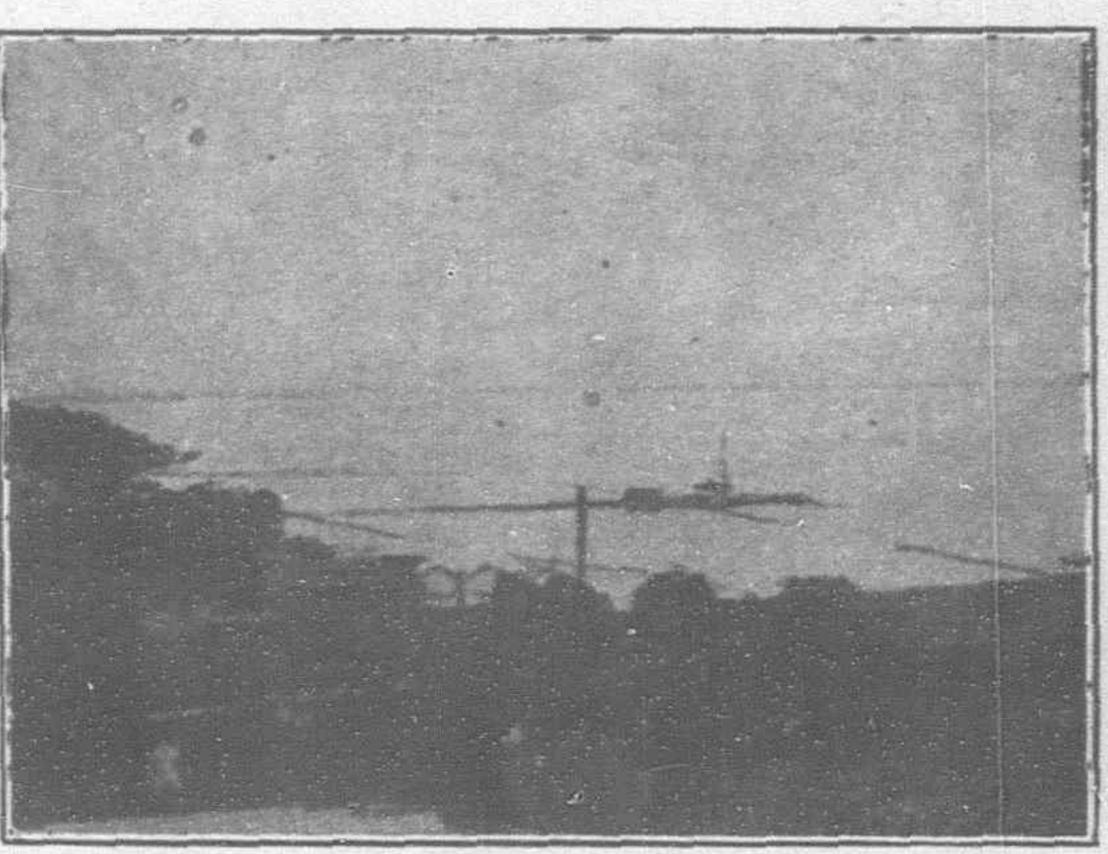
at Pulau Sebarok since the completion of the new pier. All the oil-burning vessels of the United States Shipping Board fuel here now.

The Asiatic Petroleum Co. has been equipping two islands with re-inforced concrete wharves—Pulau Bukom, eight miles from Singapore in British waters, and Pulau Samboe, twelve miles away in Dutch territory.

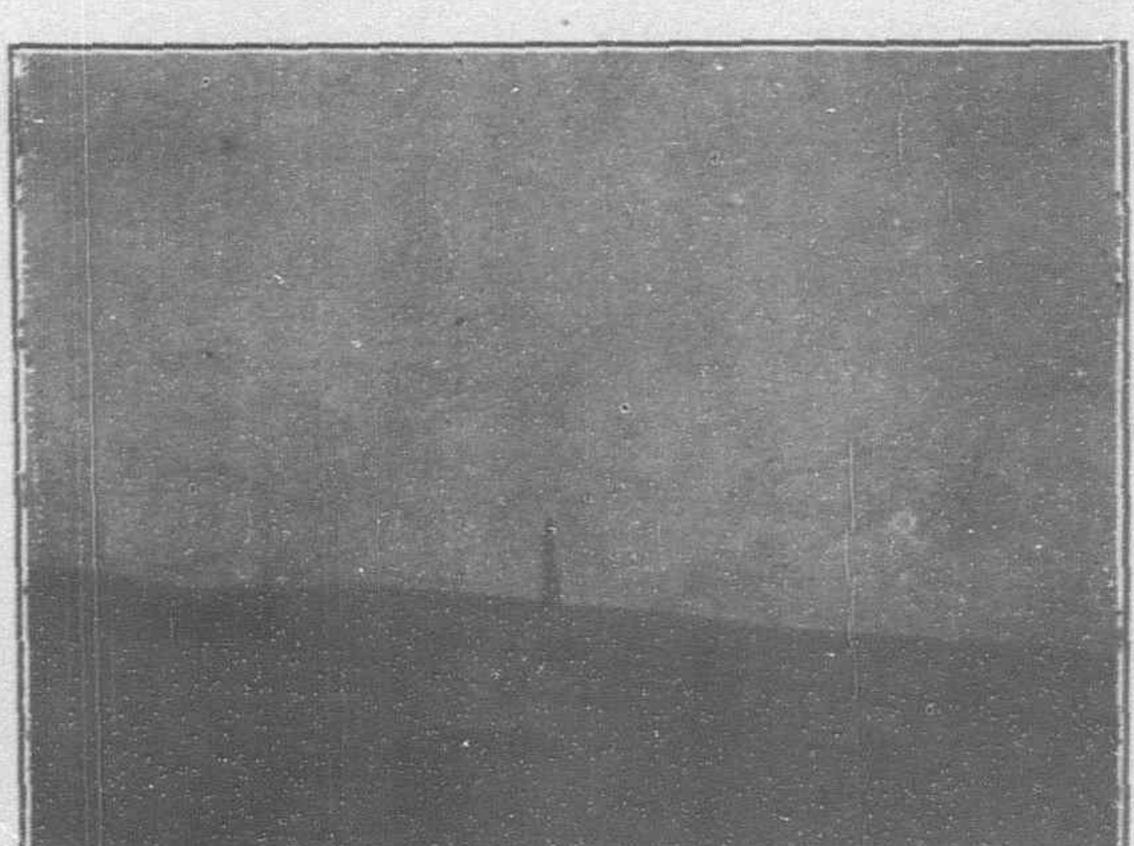
Wharf No. 2, on Pulau Bukom, was just finished in April of this year at a cost of \$280,000. The construction is similar to the Socony wharf, and the whole project fits in with the new benzine installation. Wharf No. 2 extends out beyond a field of coral reefs which is being filled in and reclaimed. Here will be the plant



Construction work on the Pulau Bukom wharf



The A. P. C.'s new concrete wharf No. 2, at Pulau Bukom. The water from the end of the pier to the shore, which seems to be marked off in a rectangle, is all underlaid with coral, and is being reclaimed to furnish space for the new benzine installation



The concrete pier recently finished for the Socony at Pulau Sebarok

culminating in a T-head. On both sides of the T-head, at intervals of 150 and 250 feet, are four buffer dolphins, also of concrete, which are connected with the approach. Concrete mooring dolphins, ten feet square, are sunk behind and to the sides of the buffers.

The piles for this wharf, 200 of them, were cast on the beach of Pulau Sebarok. The sand and gravel of the island were used in mixing the concrete. Two sizes were cast, twelve and fourteen inches square. The longest piles were 60 feet in length. All driving was done by steam.

The end of the pier stands in 35 feet of water at low tide, and can accommodate any ocean-going vessel. The two sets of buffer dolphins makes it possible for two 500-foot ships to tie up at the same time. Both tankers and cargo-boats have been taking oil

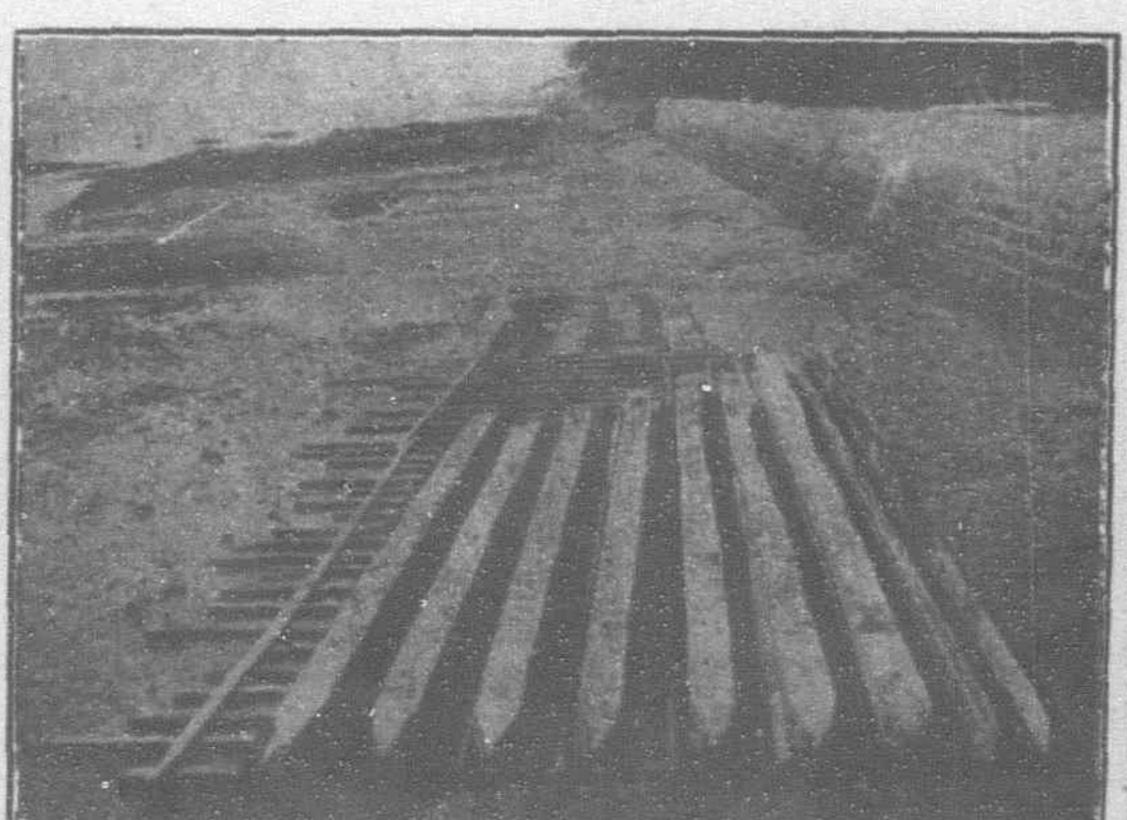
which will handle and pack the benzine refined at the A.P.C. fields in Sarawak and other parts of the Malay archipelago.

Another deep-sea wharf, No. 3, on Pulau Samboe, is costing \$150,000. While not as large as No. 2, it juts out into 35 feet of water, and can take care of ocean-going vessels. A \$30,000 tong-kang jetty, to take care of native tongkangs, or lighters, has also been included in the re-inforced concrete work on Pulau Samboe. It is built in eight feet of water, and will be used in connection with the benzine installation.

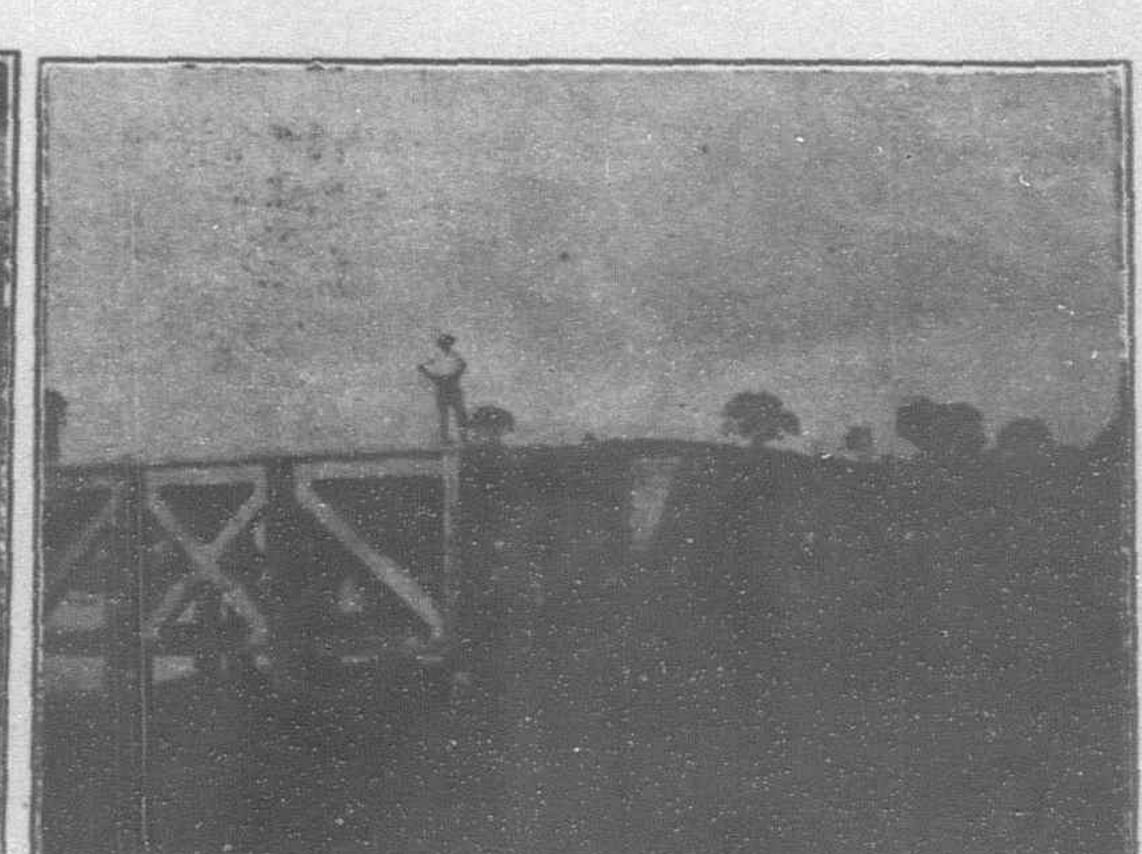
The construction of both Socony and A.P.C. has been carried on by the United Engineers, Ltd., of Singapore, under the supervision of A. F. Dale, head of the constructional civil engineering department.



Indian labor casting concrete piles for the Pulau Sebarok pier



Sixty-foot piles for the Socony wharf



Thirty-five feet of water at low tide, permits ocean-going vessels to come alongside the new Socony pier at Pulau Sebarok

## The Chartered Bank's New Building

RONTING the Bund the new Chartered Bank building will be five storeys in height, of heavy, dignified, classic design, Neo-Grec in style with little ornament.

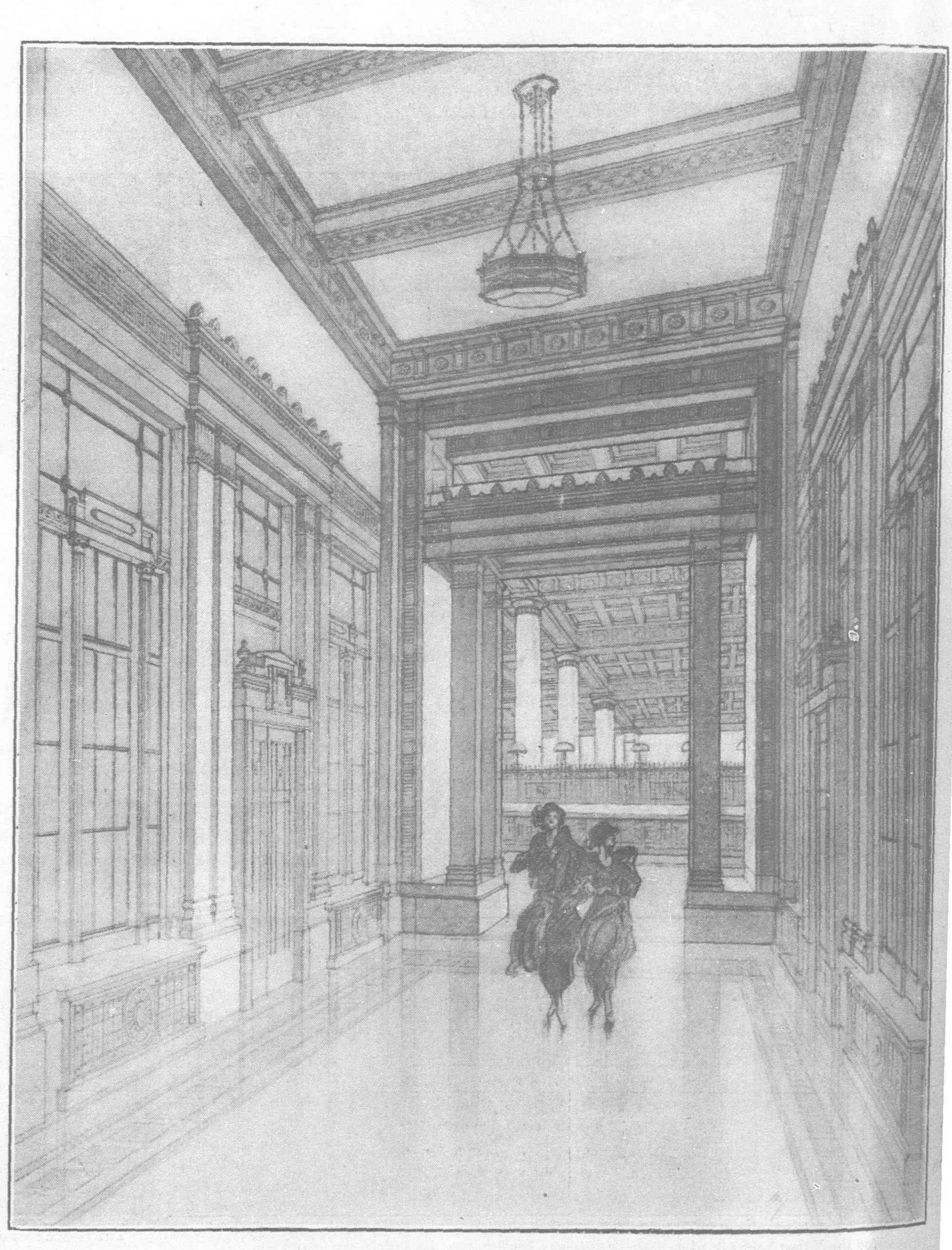
The contractors are the well-known London firm, Messrs. Trollope & Colls, who, it is of interest to note, erected the head office of the bank in the metropolis some years ago.

With the exception of the space occupied by the entrance hall and staircase giving access to the upper floors, the whole of the ground floor and subground floor will be occupied by the bank. The entrance to the bank will be a very fine pair of bronze gates made in England. The entrance vestibule is square in plan with four Brecchia marble columns, one in each angle, the walls are to be lined with Pavonazzo marble of a rich cream color with a black marble plinth. The floor will be in Roman marble mosaic and the ceiling of fibrous plaster.

The building is of steel framed construction with reinforced concrete floor and roof slabs, and fire-resisting throughout. The walls are filling only, the steel beams carrying the whole of the weight independently of the walls. The steel will be protected against corrosion and fire.

The foundation consists of two reinforced rafts, one for the main block and a separate one for the back block, where are situated the treasuries. Between the two rafts there is a straight joint. The site was piled with Oregon pine piles 25-ft. long.

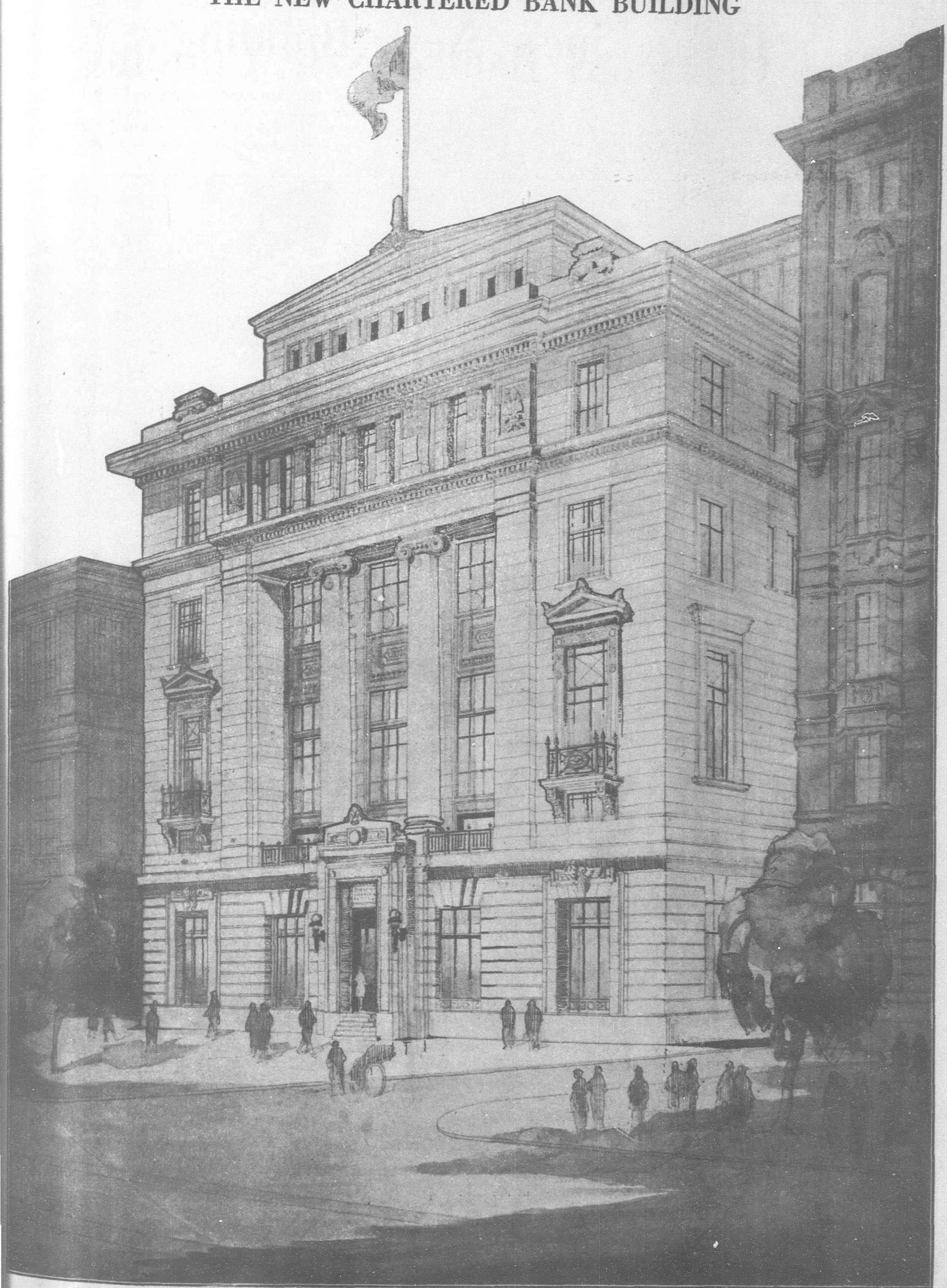
The architects for the building are Messrs. Palmer & Turner, the design having been in the hands of Mr. G. L. Wilson, P.A.S.I., who has already done so much successful work in China.



Entrance Hall to the New Building

North-China Daily News

## THE NEW CHARTERED BANK BUILDING



## Glen Line's New Building

N style, the building is free Renaissance, with clear-cut lines and imposing design. It has a frontage of 300-ft. on The Bund and Peking Road and is 90-ft. in height.

The ground floor will be occupied by the offices

on every floor, while there are separate stairways for coolies, which have been designed so that in an emergency they may be used as fire escapes. On the top floor there is a residential flat which is occupied by the general manager.

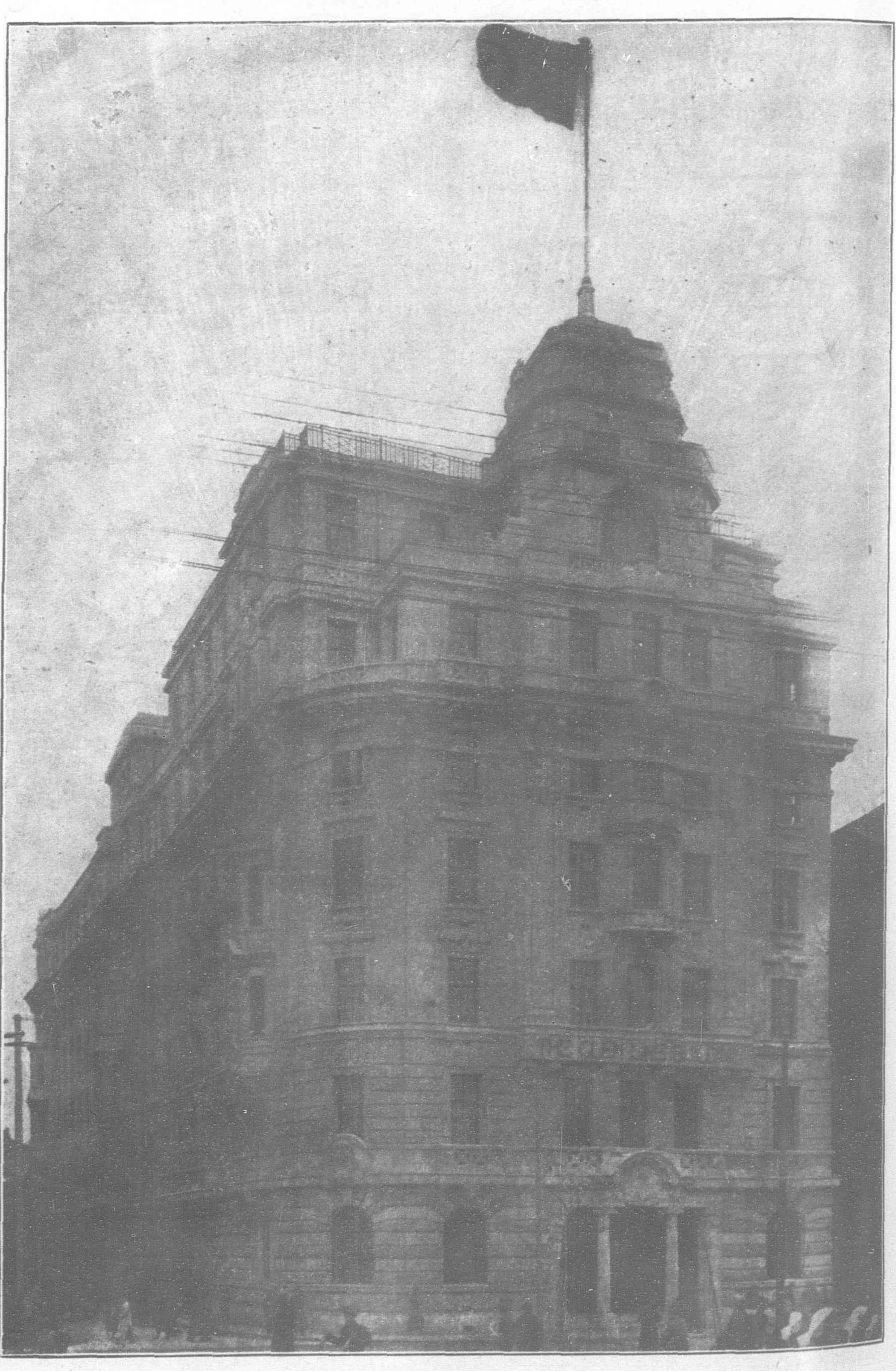
the Glen Line Eastern Agencies, with the entrance in the centre of the Bund frontage, consisting of an imposing portico with two granite columns, one on either side. Inside the main entrance is a semi-circular teakwood counter, the floor being of black and white marble terrazzo. The main office is lofty and dignified; the woodwork is all either of oak or teak, producing an effect of richness without ostentation and dignity without sombreness. The office occupied by the manager is a very fine room indeed, with panelled dado in teak, large fireplace and mantleshelf, of either side of which are large glazed cupboards. The doors to this room, and in fact to all the principal offices in the building, are large single panels with bolection mouldings.

Offices are also provided for the compradore and his staff, while there is a large strong room for books, and documents. The sanitary fittings throughout are of the most modern design.

A particularly delightful feature of the building is that the lighting is indirect, the electric lamps being concealed in large bronze bowls suspended from the ceiling, the light being obtained by reflection.

The remainder of the offices on the ground floor and all the upper floors are being let. The ground floor offices facing on to Peking Road have an imposing entrance. This office is one of the largest single offices in Shanghai, being 8,000 square feet in area.

The main staircase is situated in the centre of the north wall between two lifts, and is approached through a wide archway. Two electric lifts give access to the upper floors, which are designed as large open spaces to be divided up so as to suit incoming tenants. Sanitary arrangements have been made so that each office has at least one lavatory. Strong rooms and coolies' rooms are provided



New Building of the Glen Line Eastern Agencies, Ltd., Bund and Peking Road, Shanghai (Palmer and Turner, Architects)

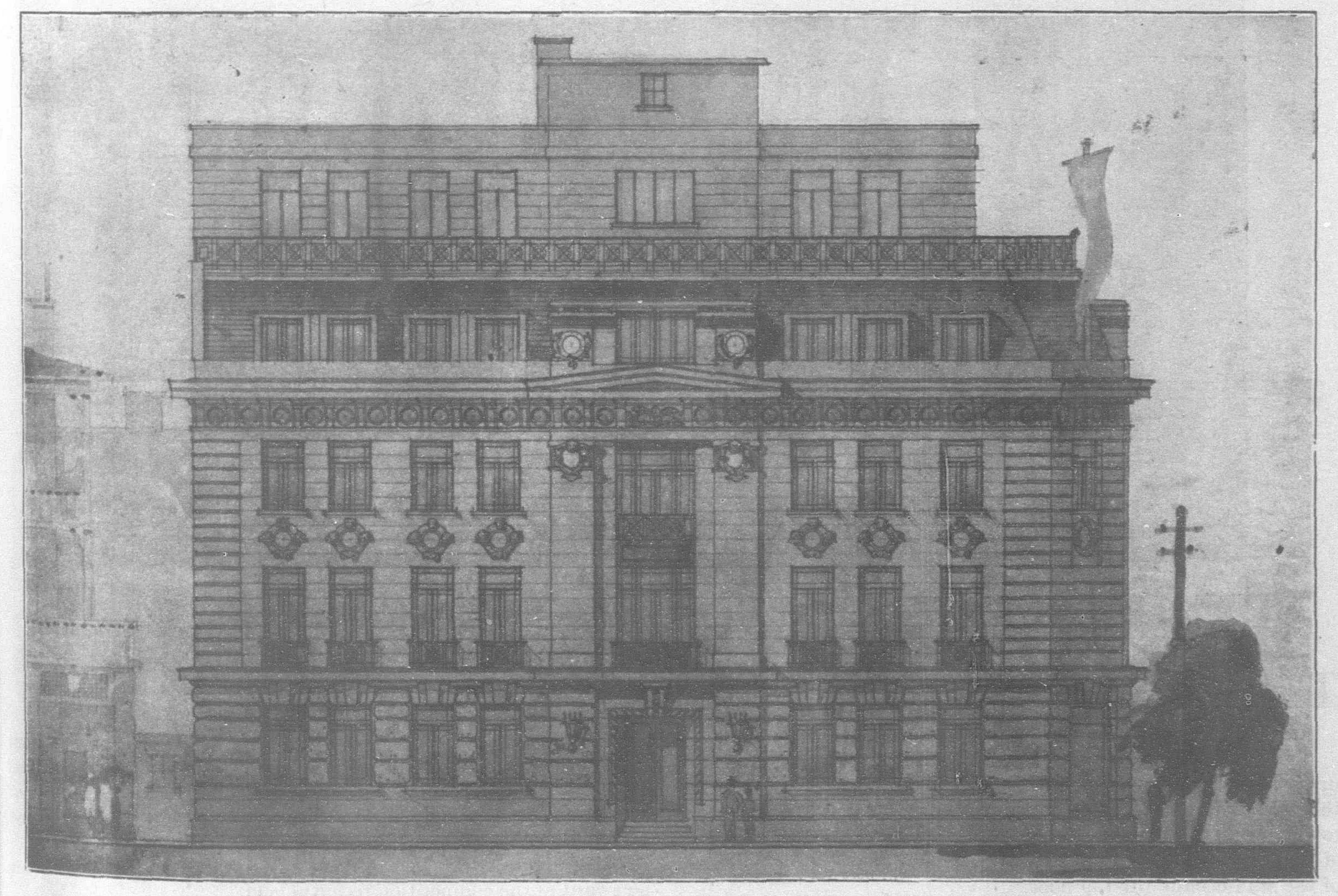
The building is fireproof throughout, built on the principle known as skeleton frame reinforced concrete, the columns, beams, roof and slabs all being of this material. The foundations consist of a raft of the same material, by means of which the weight of the building is spread evenly over the whole area.

The whole is warmed throughout by lowpressure hot water, while water is stored in
tanks for domestic and fire purposes at convenient places. Special connections have
been made to facilitate the work of the fire
brigade in case of fire. The roof is flat with
a deep ventilating space below connected to
vertical ducts wherein are placed extra fans
to circulate the air, thus keeping the upper
floors cool in summer.

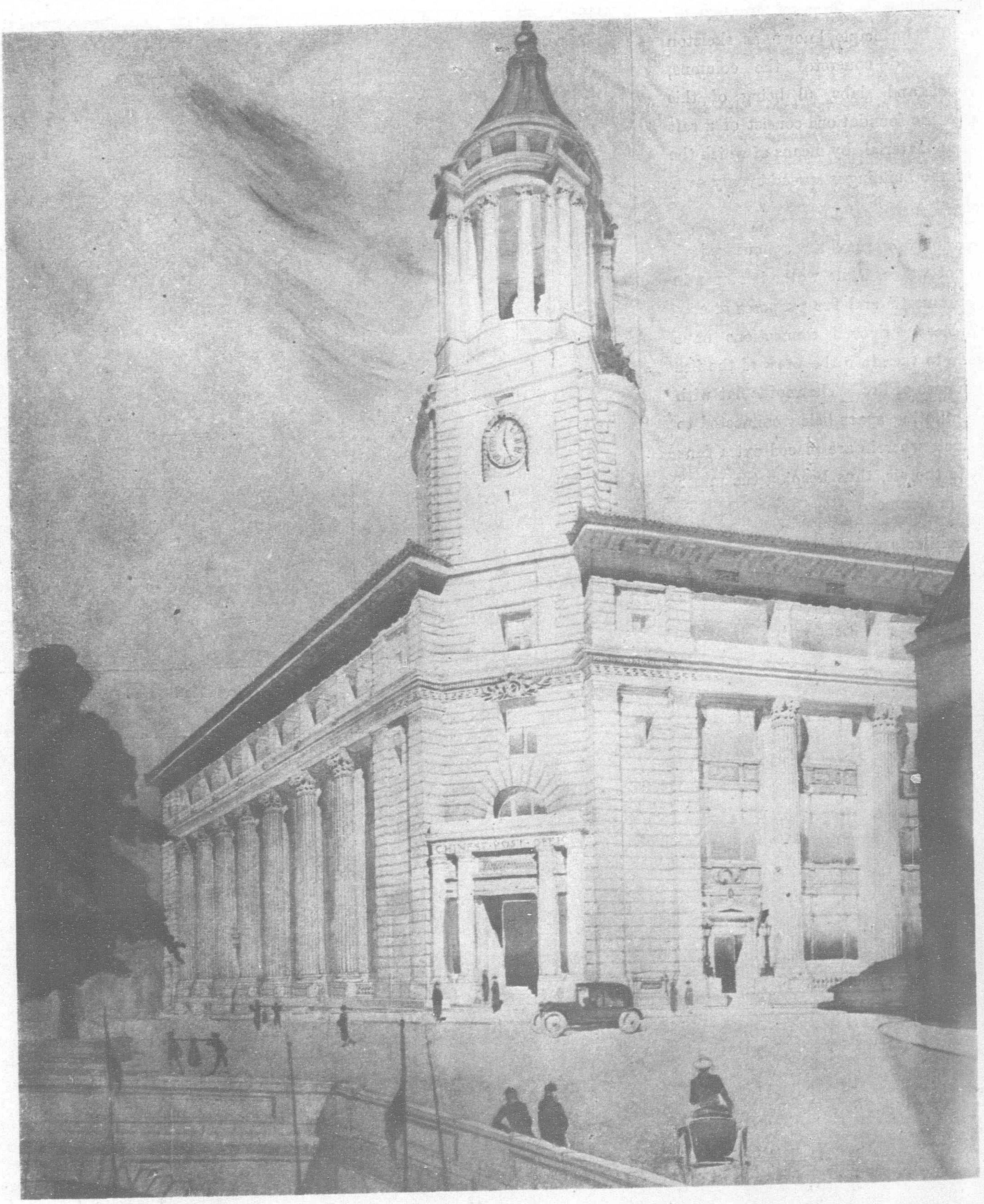
The architects are Messrs. Palmer and Turner, while the contractors are Messrs. Trollope and Colls, who have erected some very fine buildings in London and the Far East.



Glen Line's New Building, Peking Road Facade



New Office Building of the Shanghai Waterworks Co., Ltd. (Palmer and Turner, Architects)



## NEW CHINESE HEAD POST OFFICE FOR SHANGHAI

THIS building occupies a commanding site at the corner of North Soochow and North Szechuen Roads, immediately across the new bridge, at present in course of construction.

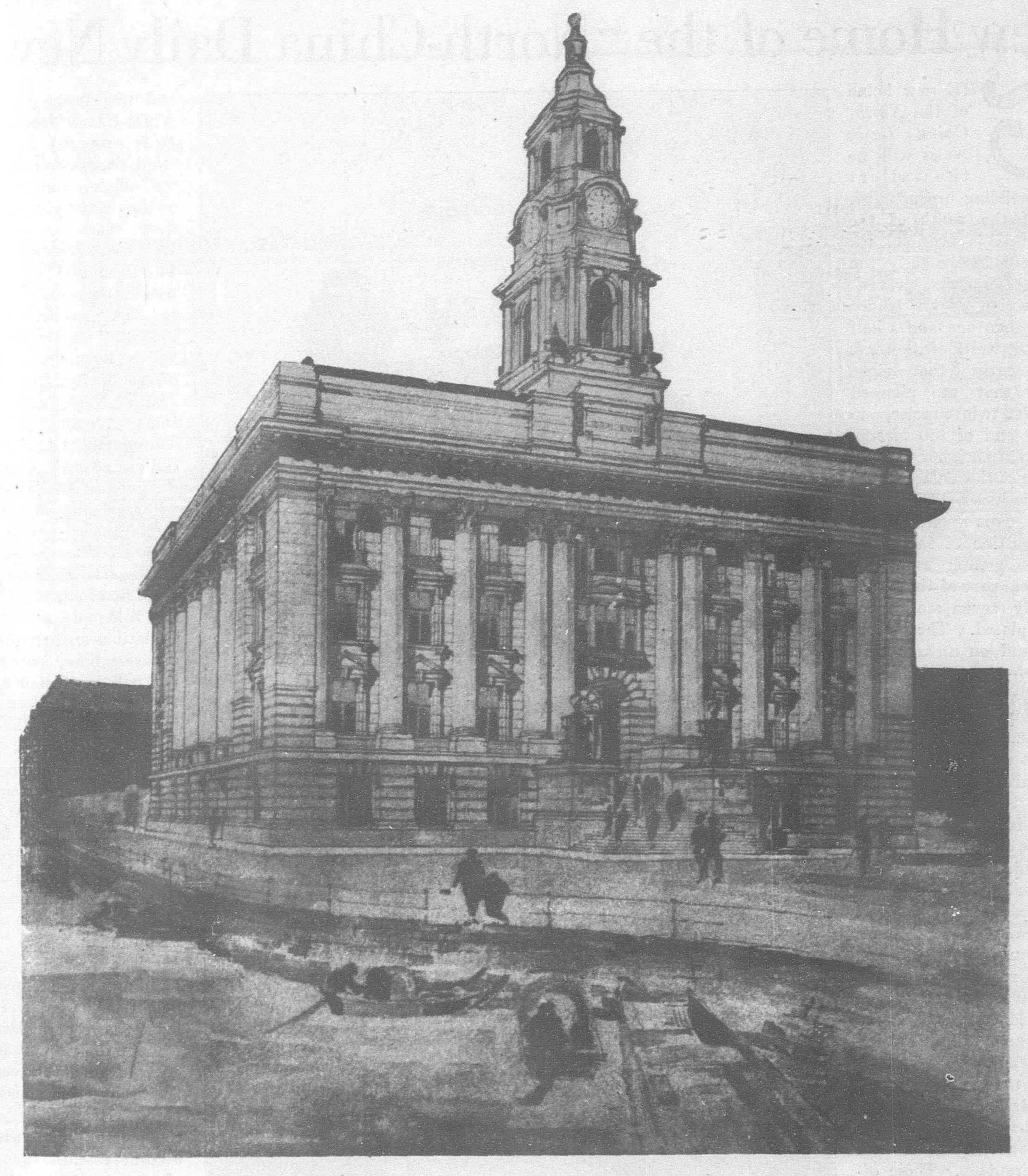
It is roughly U shaped in plan, 5 storeys in height, fronting upon North Soochow, North Szechuen and Tiendong Roads, with the various postal departments conveniently arranged to meet the requirements of the public and allow of rapid and efficient handling of in-coming and out-going mails. Flats and quarters for members of the staff occupy the top floor.

The principal facades to the North Soochow and North Szechuen Roads are designed in the form of a single massive classic colonnade rising direct from pavement to a height of more than 50-ft.

It will be constructed of granite in the lower portions and artificial granite above.

At the corner of these two frontages is placed a clock tower some 150-ft. in height, which forms a dominating feature of the design.

The architects are Messrs. Stewardson & Spence, who obtained the award in the competition recently held.



## New Custom House Building for Hankow

HIS building will stand on the site of the old custom house at the end of the Bund of the British concession.

The new building is four storeys high, surmounted by a tower rising to a height of nearly 150-ft. above the pavement. Liberal accommodation for the various departments of the customs service is provided on the ground, first and second floors, while the third floor is given up to two spacious residential flats.

The building forms an almost square plan with sides of approximately 120-ft., faced throughout with Hunan granite.

The principal feature of the elevations to the river, Ho Kai and the face looking down the Bund is a massive Corinthian classic tion is in the hands of Messrs. Gordon & Co., Ltd. order running through three storeys, with solid granite columns windows will be supplied by Messrs. Henry Hope.

four feet in diameter. The order rests on a heavily rusticated basement storey and supports a full classic entablature and strongly emphasized solid parapet wall above the same. The main entrance is of liberal dimension and faces directly down the Bund. It is approached by a very broad external granite staircase, rising through the whole height of the ground floor to the first or principal floor of the building.

The entrance halls and principal corridors will be suitably treated internally with marble and mosaics.

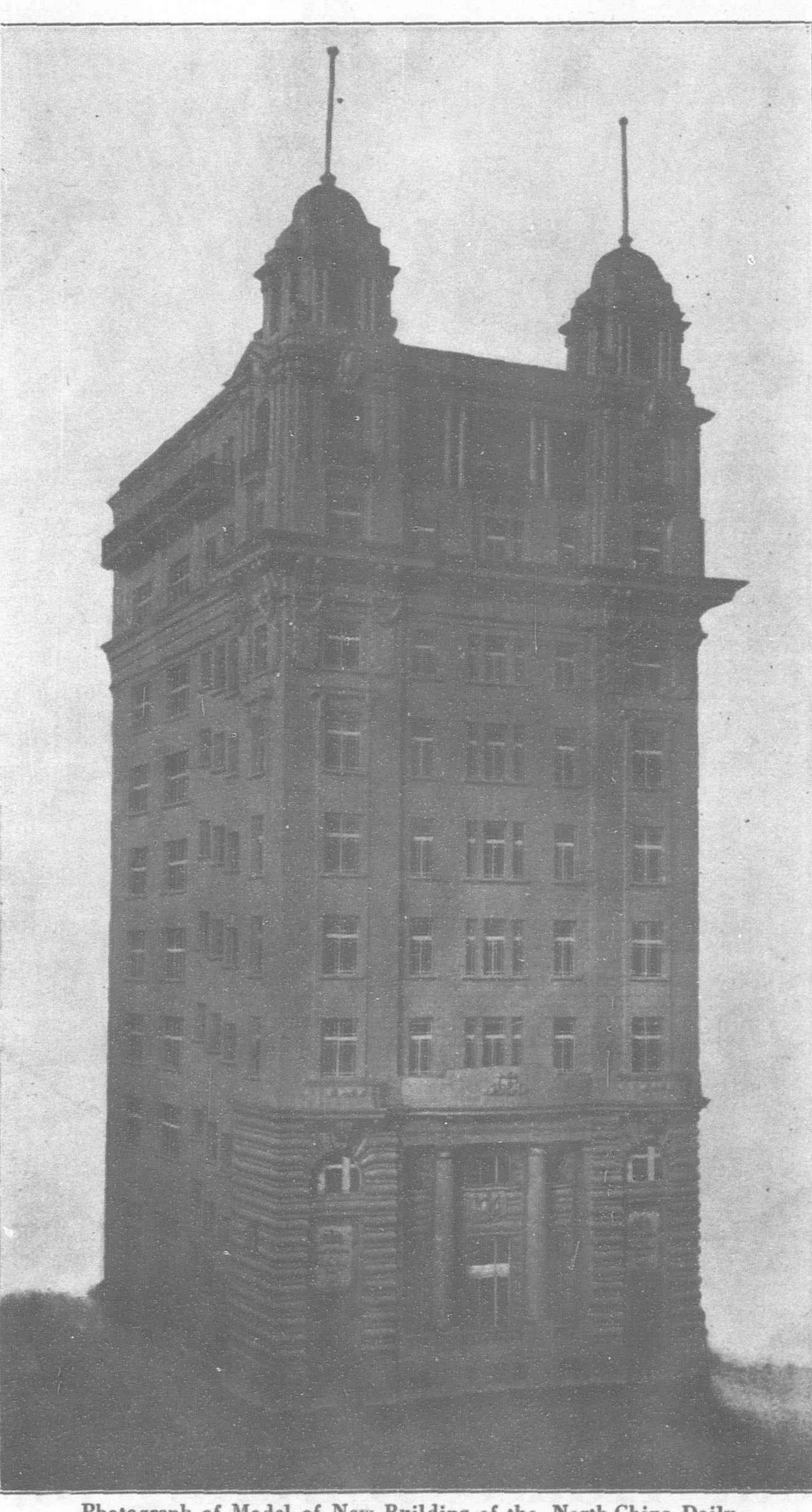
The architects are Stewardson and Spence, who obtained the award in the recent competition for the work, while the general contractors are Why Ching-kee. The heating and sanitation is in the hands of Messrs. Gordon & Co., Ltd., and the steel windows will be supplied by Messrs. Henry Hope.

## New Home of the "North-China Daily News"

HE new home of the Norththe tallest office building in Shanghai. Due to the width of the Bund this is possible, for elsewhere in the city the building by-laws prevent the erection of an edificehigher than one and a half times the width of the road. Consequently the eight storeys that are planned with the twin cupolas, one at each end of the facade; will attain a height of 140-ft. as against the Palace Hotel which is just a little under 100-ft. This applies to the front portion of the building, the greater half; for the back part of the building only seven stories are contemplated. The whole will stand on an area with a 61-ft. frontage and a depth of 170 feet, these being the dimensions of the building itself and not the plot on which it will stand.

Built of reinforced concrete throughout, with granite facings, the front of the new offices will present a dignified appearance to the Bund with a well proportioned facade in which handsome fluted columns will form the main motif, the flat roof being adorned with two towers surmounted by gilded cupolas, and between them will be erected the flagstaff.

On the ground floor accommodation will be provided for banking offices, with entrance at the northern end of the frontage. These offices will occupy the whole of the ground floor, a portion of the next floor being allotted for general offices,



Photograph of Model of New Building of the North-China Daily News & Herald, Ltd.

and the printing plant of the North-China Daily News. It is proposed to use the third, fourth and fifth floors for offices, and the plans as they stand give the whole floor space as one large area, which it is designed to sub-divide by means of patent partitions according to the requirements of tenants. On the fifth floor will be located the editorial offices of the North-China Daily News and above them residential Throughout the building the ceilings, which have been designed on the latest lines, will give a flat even surface by means of patent filling between the beams supporting the reinforced concrete floorings.

Adequate sanitary installations are to be provided on every floor, central heating will be installed, and three passenger lifts will run, in addition to the necessary number of staircases. On the outside of the building there will be emergency staircases, for use in case of fire, which should be unlikely in view of the nature of the fireproof construction, giving all the necessary facilities for escape from the building in case of an outbreak.

The rear half of the building, seven storeys in height, will be separated from the front building by a hollow double wall designed to deaden the sound of the printing machinery at night. Here will be housed the presses, lino-types and all other essential equipment of an important up-to-date printing establishment, while sufficient space will be allotted to storing of paper and other supplies.

### Netherlands East Indies Railways Electrification

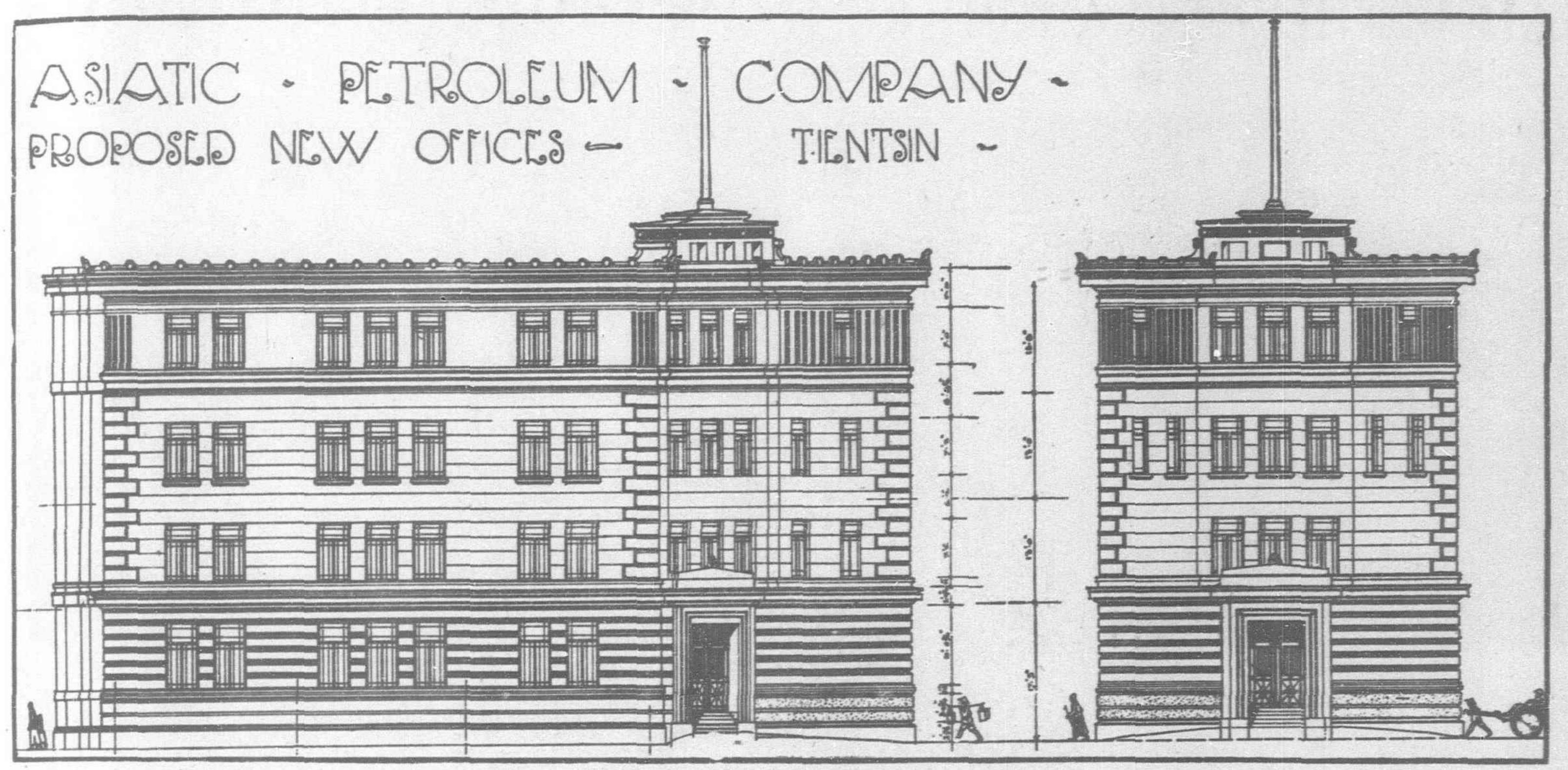
After close study of conditions extending over several years, the Dutch East India authorities have decided to electrify the whole railway system. Direct current at 1,500 volts is to be used, but later the Batavia-Sourabaya section may be raised to 3,000 volts direct on a single-phase system if conditions warrant.

Two power stations, giving about 40,000 horse-power, are being erected, one to the south-west of Sukabumi on the Tjitjatih, about 63 miles from Batavia, and the other on the Tji Anten, about 44 miles from Batavia. It is estimated that of this 40,000 horse-

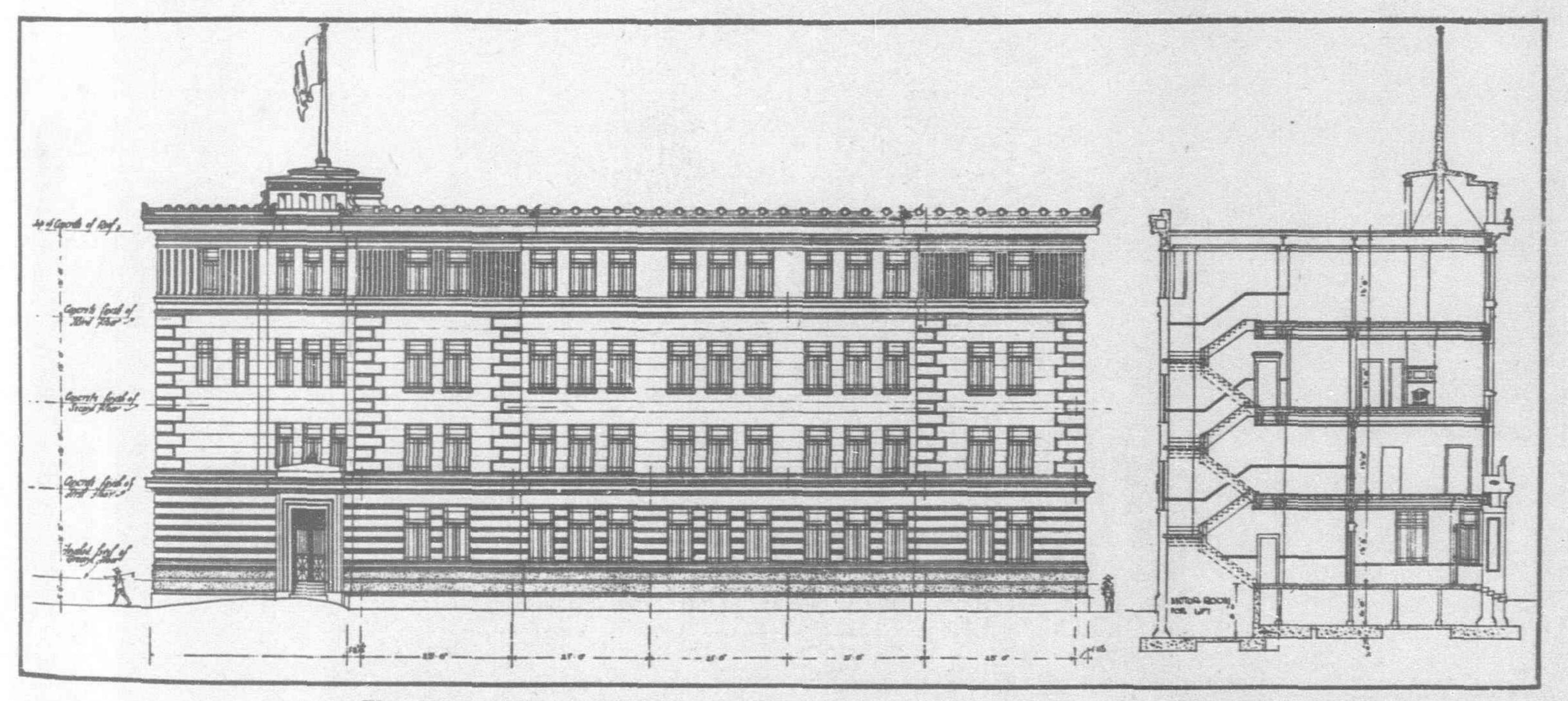
power, 30,000 will be required for the line and that 10,000 will be available for light and power in other directions.

It is expected that the first part of the line, between Meester Cornelis and Tandjong Priok, will be in operation early next year.

Tandjong Priok is sharing to a large extent in the awakening of activity observable in the Far East, and the electrification of its rail service should assist its development and add to its importance. A project is under consideration to erect a tin-smelting works at this part, and British experts have been consulted to assist in the decision as to whether open or closed furnaces should be used. Once this question is settled it is expected that the work of erection will proceed.



Elevation to Meadows Road., S.E.



Elevation to Taku Road, N.E.

Elevation of Circular Portion at Corner Section A.B.

## Asiatic Petroleum Company's Offices at Tientsin

The plans show a four-storey office building with living quarters above, to be constructed for The Asiatic Petroleum Co., Ltd. The building will be a steel-framed structure with granite facing. It is finished throughout in first-class modern style; central heating and electric lift are provided. Special precautions are being taken against the extremely cold winds of winter and the dust-storms spreading from the Gobi Desert, double windows

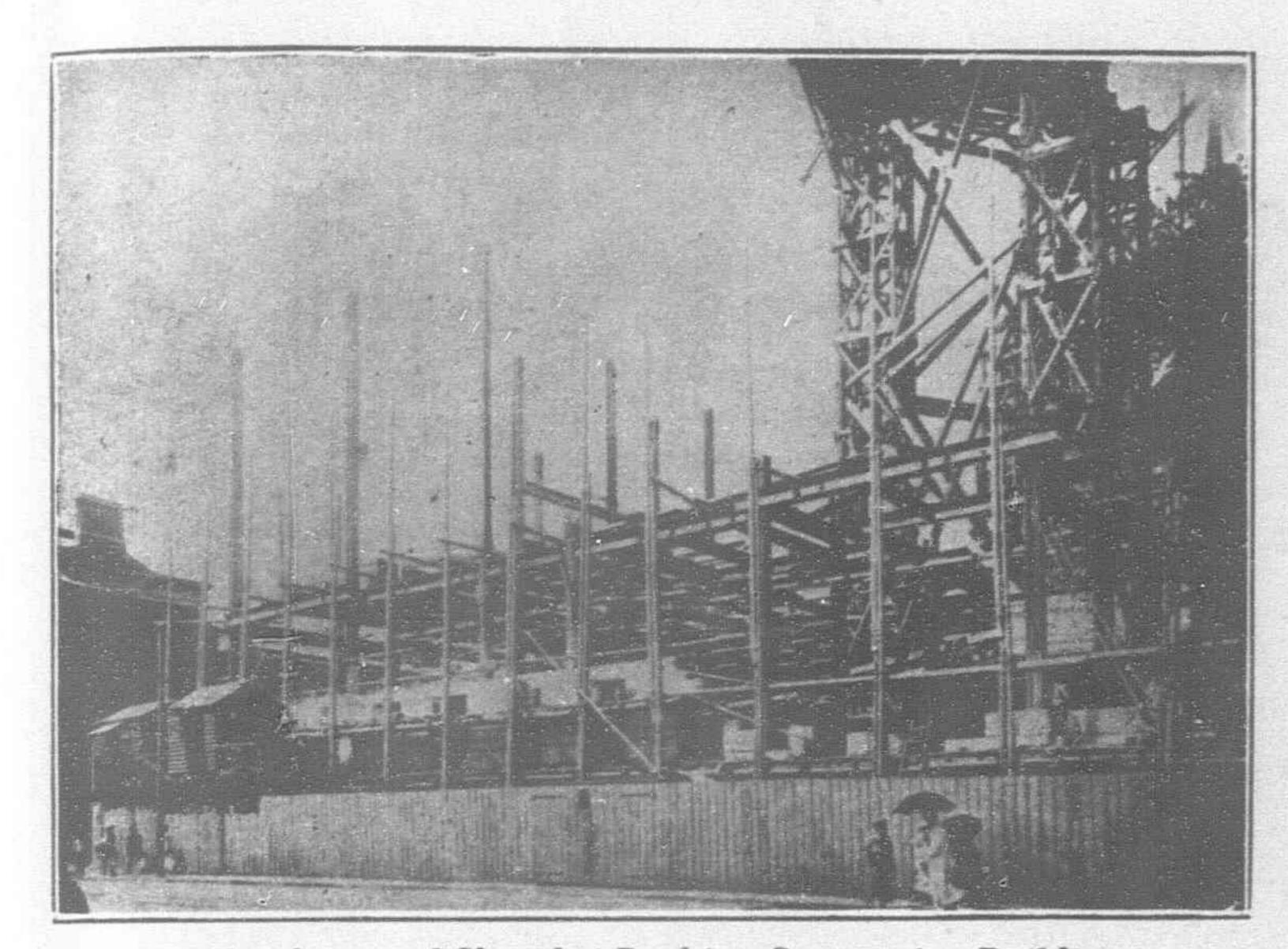
being provided where necessary. The building is fire-resisting, and is to be fitted throughout in a serviceable and up-to-date manner, due regard being had to the making for cleanliness and reduction in cost of upkeep.

The architects are Palmer & Turner, of Hongkong, Shanghai and Hankow, whose London address is c/o Mr. F. Oswald Reynolds, M. Inst. C.E., of 109 Victoria-street, S.W.1.



THE HONGKONG AND SHANGHAI BANKING CORPORATION'S NEW BUILDING AT SHANGHAI Drawn by Cyril A. Farey: Palmer and Turner, Architects

## PROGRESS VIEWS OF BANK BUILDINGS IN SHANGHAI

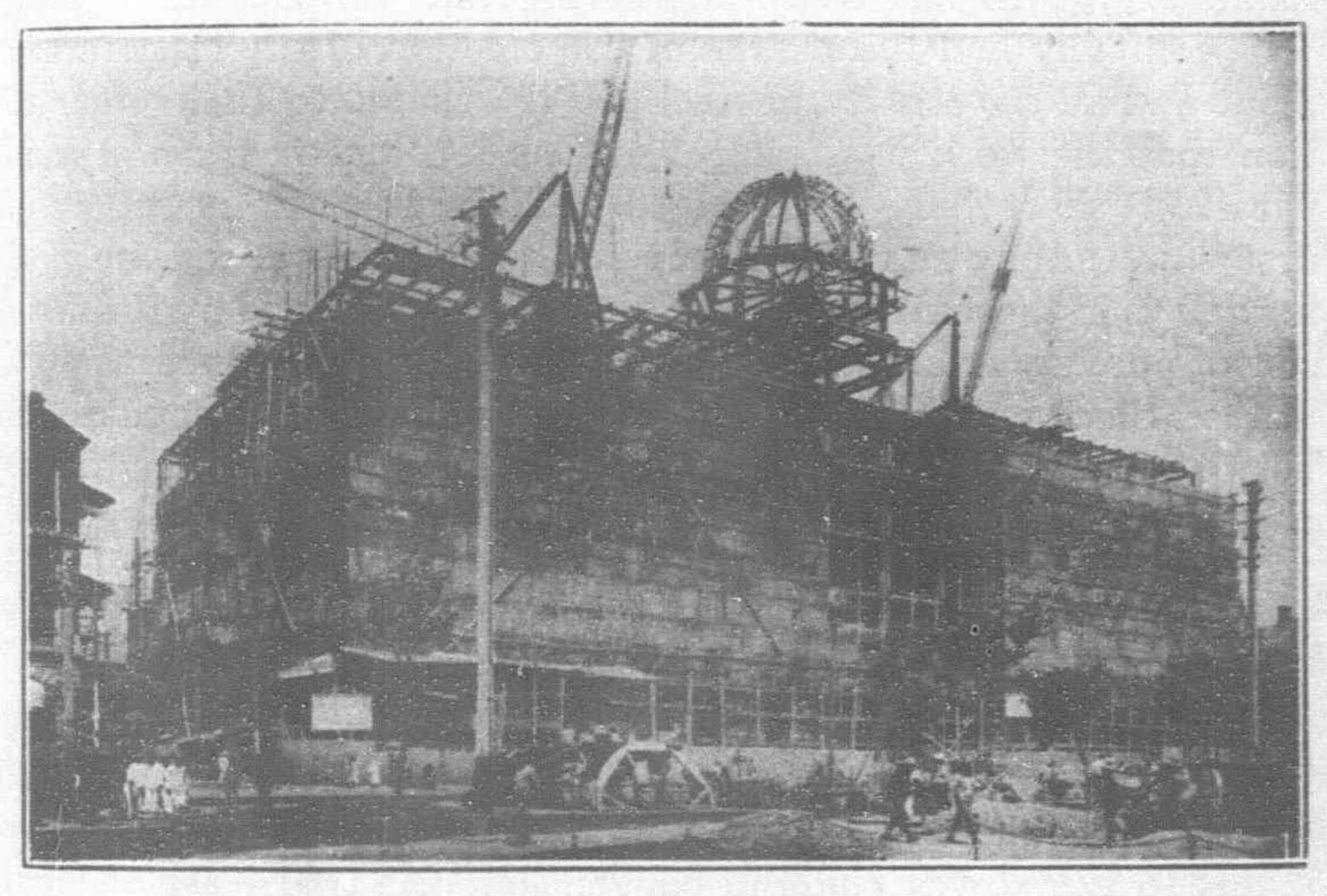


The Hongkong and Shanghai Banking Corporation Building, Shanghai, August 2, 1921

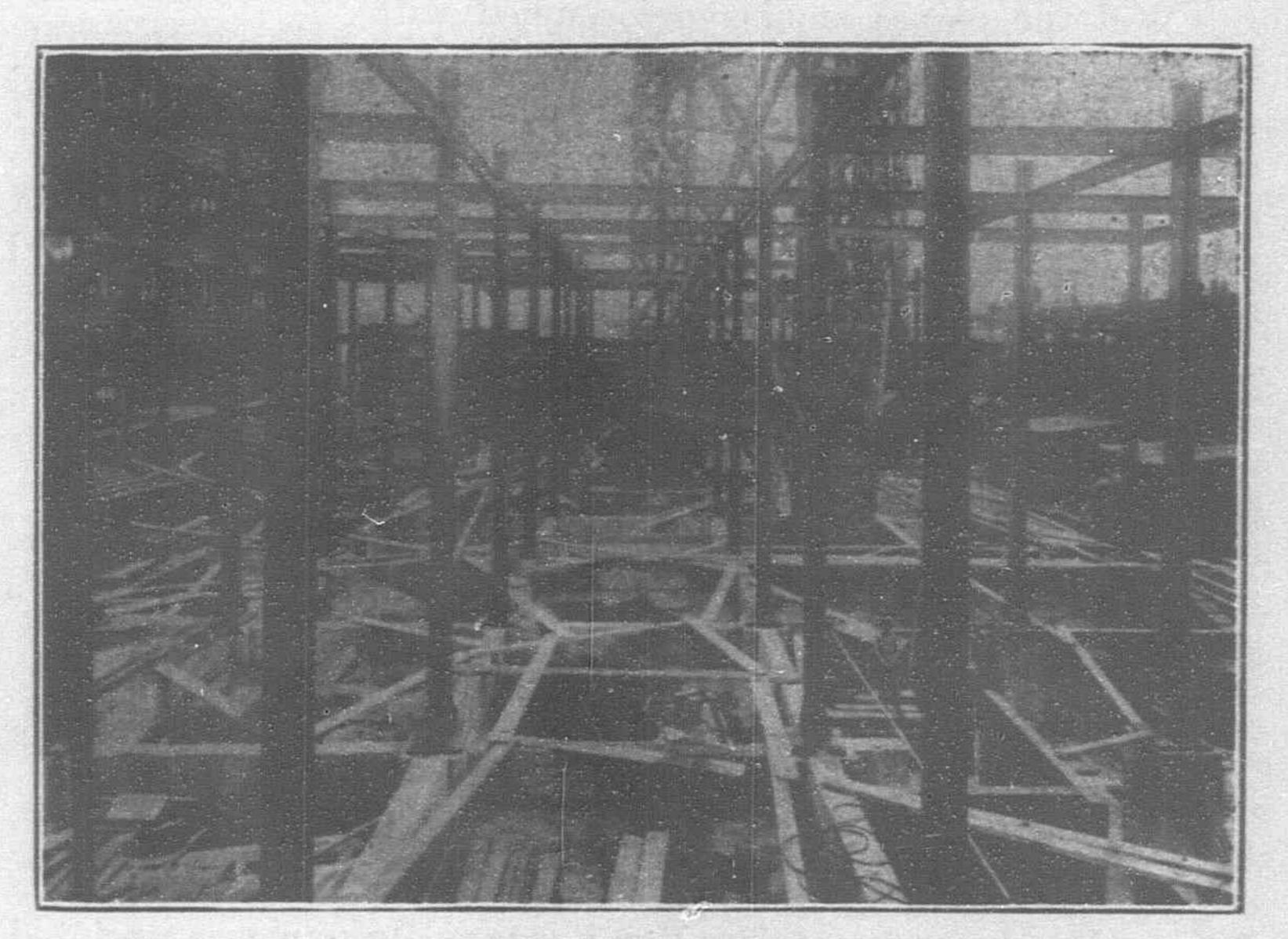


THE SITE OF THE NEW CHARTERED BANK BUILDING, OCTOBER 16, 1921

View of Excavation for Front Block, Looking East. Palace Hotel on left and some of the old piles in background. Concrete Mixer on left



June 19, 1922



View on February 28, 1922. Looking East towards Bund Front

### OFFICE HELPS IN CHINA

proved its superiority over the abacus, the age-old calculator of the Far East, to such an extent, according to Trade Commissioner Lynn W. Meekins, that the latter lost a good deal of the veneration it heretofore received. Up to the time of the contest, which was between an American salesman for the adding machine and a Chinese adept in the use of the abacus, the latter device had been regarded as an insurmountable obstacle to the general sale of the former in China. The contest was witnessed by a large number of spectators, according to Mr. Meekins, all of whom were surprised by the marked superiority of the American device.

"With more than 8,000 foreign firms, including Japanese, hundreds of native progressive firms in the treaty ports, and numerous government offices," Mr. Meekins says in a report to the bureau of foreign and domestic commerce, "China is buying a

In a recent contest at Shanghai an American adding machine steadily increasing quantity of American office specialties annually. For several years the value of exports of American typewriters to China has averaged about \$250,000. Adding and calculating machines, duplicators and devices-such as check protectors, time and date stamps and pencil sharpeners—are being sold in the large commercial centres. Metal furniture is in demand on account of climatic conditions along the China coast, and filing and loose-leaf equipment is finding a fair market.

> "American firms in Shanghai are actively pushing the sale of office specialties with very satisfactory results. By sending experienced representatives to demonstrate the merits of modern equipment to business men in the outports, they are in a position to take orders and make prompt delivery from stocks carried in Shanghai."

### New Cigarette Machine

## Expected to Revolutionize Cigarette Industry

A DVICES have been received from our American correspondents advising that a machine for making cigarettes of entirely new design and construction has been placed on the market.

This machine, which is called the "Tri-umph—Model UG" is capable of making 800 plain or tipped cigarettes per minute, or approximately one-half million cigarettes per day. Devices can be furnished for making either round or oval cigarettes to be pasted or crimped, either plain or with tips of gold, cork or paraffin.

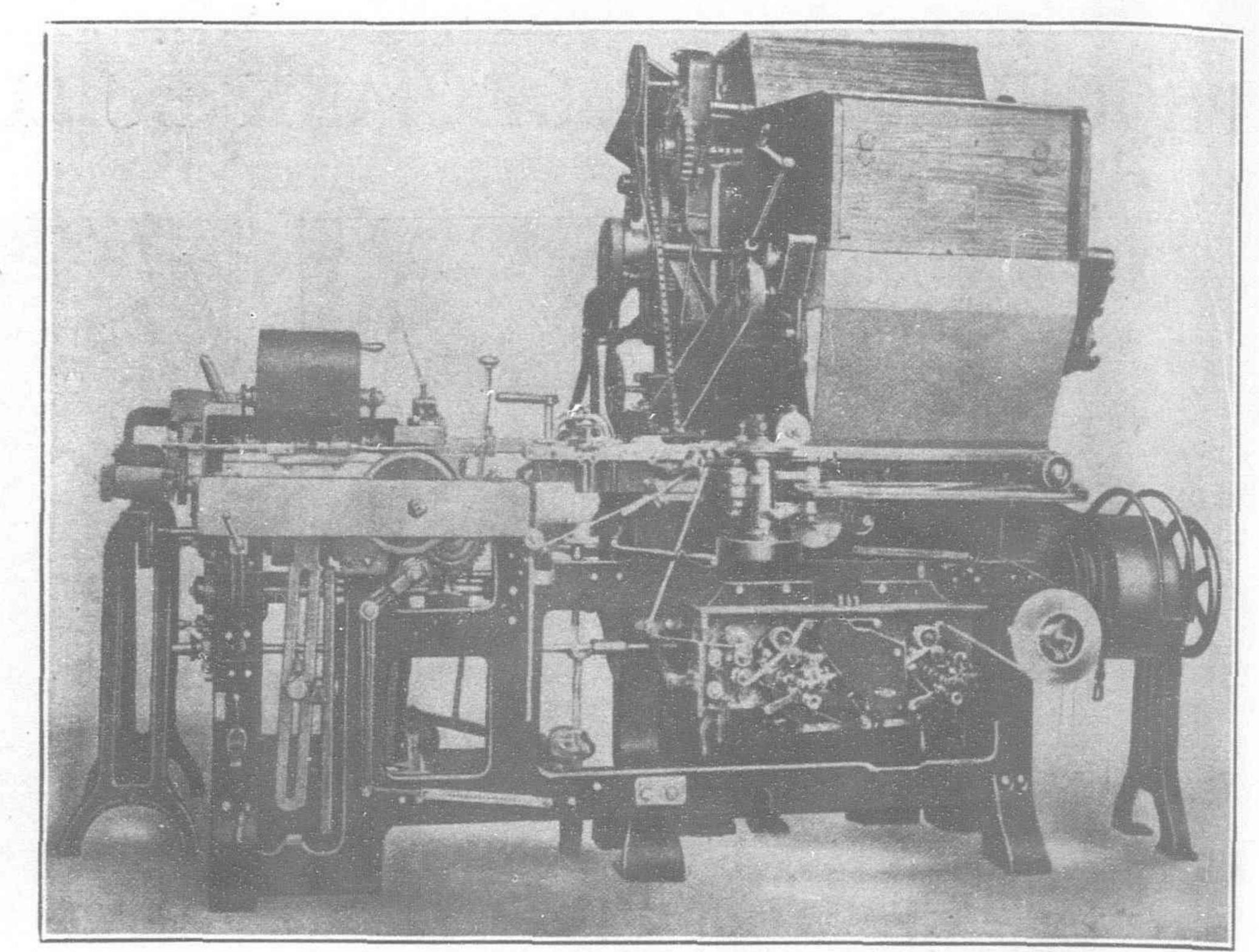
Aside from this phenomenal production which is practically double that of any machine formerly known, the machine is a marvel of simplicity and can be operated by inexperienced girls. Simplicity and durability have been combined, and cigarette producers at least can secure a machine with a minimum of parts subject to wear and which have to be replaced.

Will the casual smoker preoccupied with his daily cares, who enjoys the soothing balm of the cigarette, stop to consider that his smokes are made at the rate of one-half million per day on a single machine operated by two girls? Perhaps he will also be interested to learn that Virginia, the home of tobacco, has also fostered and given to the world the mechanical means for making cigarettes.

Nearly a half century ago the original cigarette machine named "Bonsack" was introduced by the United Cigarette Machine Co. of Lynchburg, Virginia, whose "Universal" and "U-K" models are also known in every corner of the world. The latest achievement of the pioneers of the machinery for the great industry is their new model "TRIUMPH" machine which the manufacturers state will revolutionize the industry.

### The Lungyen Steel Works

IN the March number of The Far Eastern Review was reprinted an article from the Journal of the Association of Chinese and American Engineers describing the new Lungyen steel plant in North China. The article, however, failed to mention the prominent part in the erection of the plant assigned to the French Engineering Works of Shanghai (Société Franco-Chinoise de Constructions Metalliques et Mecaniques) more familiarly known under its old



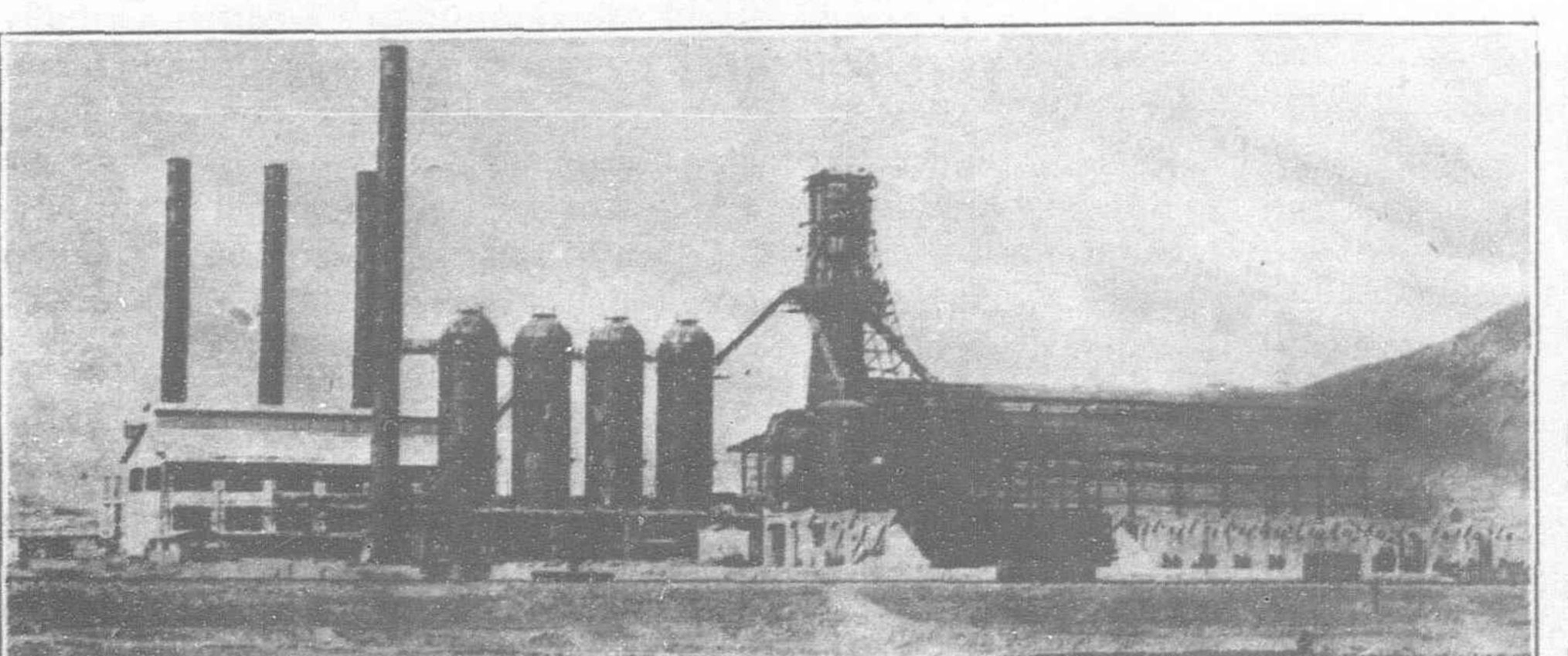
The "Universal" Cigarette Machine, capacity, 250,000 crimped or 275,000 pasted cigarettes per day of ten working hours, manufactured by the United Cigarette Company

name of the Nicolas Tsu Engineering and Shipbuilding Works. This company had full charge of the erection of the blast furnace plant and all the structural steel and it was due to their organization that the work was carried out successfully in such a comparatively short time. Starting August 2nd last year, progress was at first slow, the erectors being hampered by the frequent and unlooked for delays in the arrival of material from America, and by the necessity of purchasing or making many special tools and other materials at their Shanghai plant and shipping them north. Communications between Shanghai were many times interrupted, delaying the arrival of tools, skilled workmen, etc.

This achievement is a time record upon which the French works may justly pride themselves.

The work comprised the following items:-

One blast furnace of 250 tons; one skip bridge; one coke bin; four hot blast stoves and chimney; platforms around stoves and chimney; bleeders, downcomers, dust catchers, gas mains to the stoves and the boilers, hot and cold blast mains to the blowers, etc.; three boiler chimneys; one boiler house; one power house; one cast house; pump houses; water tower; other auxiliary structurers. The total weight of all structural material was about 1,800 tons.



The Lungyen Steel Works

### Japan Gets Cable Contract

A contract is reported in Japanese circles to have been concluded between the Chinese government and the Furukawa Mining Co. It calls for the laying down of a cable between Shanghai and Chefoo, a matter which has been hanging fire for some considerable time, partly due to the anti-Japanese movement let loose by the students with an energy worthy of a better cause, and to a large extent on account of the chronic lack of funds on the part of the Chinese government.

The Furukawa Mining Co. is not only one of the largest Japanese industrial corporations, but one of the most important in the entire business world.

### The Far Eastern Review

A Monthly Review of Far Eastern Trade, Finance and Engineering, Dedicated to the Industrial Development and advancement of Trade in Far Eastern Countries

ENGINEERING

FINANCE

COMMERCE

5 JINKEE ROAD, SHANGHAI, CHINA

Telegraphic Address: Farview, Shanghai

SHANGHAI, JULY, 1922.

### Machinery Trade in China

Why British and American Manufacturers of High Grade Machinery and Machine Tools Suffer in the Competition for Chinese Trade.

THE following remarks on the machine-tool trade of China from the Hongkong correspondent of The Times Trade Supplement contains certain facts that all foreign manufacturers of machinery will be wise to take notice of. We do not altogether agree with the writer's assertion that the Chinese are always looking for the cheapest bargains, for if this were true, there would be few sales of high-grade machine tools in this country. His remarks, however, do hold true to a large extent as far they relate to the smaller Chinese machine-shop owners. The essential point in what he says, is embraced in the statement that "It is unfortunately true that the Chinese feel that they are taking a risk in buying almost any machinery, because very few are able to judge the merits of design or construction." We invite attention to this, as herein lies the answer as to whether engineering advertising in Chinese papers is of any value. In the first place, there are no equivalents in the Chinese language for foreign technical terms, and there is no way to bring out forcibly the merits of any particular machine. The best that can be done is to appeal to the foreign-educated Chinese engineer, who is consulted at some stage of the negotiations for any large order, and his opinions acted upon.

About all that can be hoped for is to educate the Chinese to the reputation of a name or chop and what these names stand for in their particular line. In other words, the same process of education must be carried out in China, Japan and other Oriental countries, that has proved successful in other parts of the world. The machinery manufacturer must follow the same publicity methods as he would at home, advertising his own specialities under his own name. The tendency to group a large number of manufacturers under one representative or selling agency in China, has its merits in cutting down the selling overhead, but in this zeal to decrease expenses, the question of publicity is invariably ignored. As a consequence, the Asiatic purchaser of machinery, who has not been educated to the merits of mechanical specialities made by well-known foreign firms, has no option in the matter. He simply insists on having the cheapest machine tool or other machinery that will do the work. In a field where the manufacturers of all nations are evenly represented, and where quality in many cases is sacrificed to price and terms of payment we cannot blame the uneducated Chinese from placing his order with whoever quotes the lowest and gives long credits. The fault does not altogether lie with the Asiatic. It must be shared by those manufacturers, who for years have turned a deaf ear to all suggestions about proper publicity in this field, insisting that his agent stand the full burden of educating the Asiatic in engineering matters. The Chinese, like the Japanese, can be educated to purchase high-class machinery and machine tools, but to do this requires a radical departure from present publicity methods. The manufacturer must make up his mind that if he is to succeed in this field, he must select an engineering medium for his advertising and stick to it, in the same manner that he does at home. The cumulative effects of such advertising are the same. Most of the successful machinery manufacturers

in this part of the world are those who years ago recognized this fundamental principle in Asiatic business and are now reaping their rewards in orders.

In some cases that we could mention, these methods have obtained for the manufacturer a practical monopoly of the business in their respective lines. Proper publicity will strengthen the hands of local agents and make for increased orders, the same in China as in the United States, England or other markets. When the manufacturers of high-grade machinery (British, Americans, or of any other country) realize and act on this fundamental truth, the day will arrive when the Chinese buyer will be as discriminating as those of any other country.

The root trouble with most large foreign manufacturers whose names are well known to engineers in other countries, is that they assume, as a matter of course, that the prestige of their name has also spread to China, and the mere fact of hanging out a brass sign along with a dozen or more in front of some agent's office, is going to duly impress the field with the fact that he is in China to do business. As a matter of fact, the name of the greatest manufacturer of any specialty (especially in the engineering lines) means nothing to the average Chinese. They refuse to be impressed. The manufacturer who makes good in China is the one who has the initiative to take upon his own shoulders the expense of advertising his engineering specialities in an engineering publication.

Following this up by a proper campaign that will make his particular name and specialties known to the field. It is the only road to success in Asia.

Such advertising may not reach the smaller Chinese, Japanese or other Asiatic machine shops or mills, but it will reach the more important, and pave the way for the education of smaller concerns, who, as they expand, will demand the higher grade tools and machines that have proven successful in the larger plants. The following article was intended primarily for British consumption, but the same facts hold good with high-grade machine tools from other countries. It is not altogether German competition and low prices which attract the Chinese buyer. The Japanese machinery manufacturer is also very active and many of their specialities have found a secure place in the Chinese machinery trade. The number of machine tool and machinery manufacturers in Japan is constantly increasing, and their products are considered good enough for the vast majority of Japanese machine shops. They will also find their place in the smaller shops of China and other parts of Asia.

The time has arrived when other machinery manufacturers must face these facts. If they lose the market there is no use of blaming the Chinese for their lack of appreciation for better grade tools and machinery. Educate them in the same way other peoples have been educated and they will demand the best.

G. B. R.

The Hongkong correspondent of The Times Trade Supplement writes:

"A few days ago a representative of a Danish machine tool company arrived in South China. Although the traveler did not bring his prices directly to the notice of the writer, it has been possible to obtain a copy of those quoted to local firms. They seemed at a first glance to be remarkably low. This led to enquiries concerning the local selling prices of British machine tools, and the results are of considerable interest.

"It should be understood that the present discussion is confined solely to the question of price, ignoring considerations of quality. In the eyes of the Chinese buyer, however, the price means almost everything. A local agent showed a Chinese from Canton a price list in which a certain machine tool was quoted at £50. The Chinese customer immediately said: 'I buy that one—velly cheap. Suppose no good, lose only a few hundred dollars.' It is unfortunately true that the Chinese feel that they are taking a risk in buying almost any machinery, because very few are able to judge the merits of design or construction. Many Chinese buyers of engineering products are unable to distinguish between a very good article and one that is lighter and generally not so reliable.

"Consider first of all the local selling prices of screw-cutting 6-in. lathes. The price of a British lathe is £267, while the foreign-made machine can be supplied at less than half the price—namely £130. It is noticeable that on this list of foreign lathes there has been a reduction since last year. Then the price was £130. No doubt the British lathes have also been reduced in price, but it has not been possible to obtain a list. British manufacturers do not publish their prices as freely as the Chinese would like. The exception is the motor industry, and other engineering manufacturers might follow that

lead.

"Take now 8-in. lathes. A local quotation for a British lathe is about £400; the foreign-made machine can be sold in South China to £230. Again, the British 10-in. lathe, which is quoted locally at £537, seems to the Chinese buyer ridiculously high in price as compared with its competitor, which is quoted at £325.

"It would be possible to give many similar comparisons, but the general result would be much the same. It may, however, be noted that this price list of the non-British machine tool company is in English, and that the lathes have such essentially British names as "Lion" and "London" and 'Calcutta.' One lathe is called 'Britannia'!

"For American machine tools it has been difficult to obtain local prices, but the Chinese say that they are lower than those quoted for British

machine tools.

"It will surprise some readers of this journal to learn that a certain shaping and planing machine giving a 10-in. length of stroke (hand power) is quoted at £20 for local sale. A British shaping machine (stroke to 12-in.) costs £200 in China, whereas this foreign firm sells a 10-in. machine (not hand power) at £50, and a 16-in. machine at £106. Last year the latter machine was priced at £126. British 16-in. to 18-in. machines are quoted locally at £250, while the foreign firm will supply a 22-in. machine at £150, the 18-in. machine being £120.

"To quote comparative prices of planing machines, a British machine 6-ft. by 30-in. costs locally £625; a machine of very similar dimensions from another part of Europe costs £370. The latter is called the 'Asia,' doubtless with the idea of conveying the impression that it was built for this market.

"A British 25-in. drilling machine costs locally £215, while its foreign-made rival, a 24-in., costs £68. That is just about typical of drilling machines.

"These figures were supplied privately by one of the local agents who much wishes to sell British machine tools. They were given in all good faith, and while it may be true that in the course of business they may vary a little,

yet for comparative purposes they may be accepted.

"Unfortunately, it is not only in the machine tool industry that the British agents in China find themselves hopelessly undercut. At present local conditions make the British engineer in the Far East none too happy concerning the supply of machinery from Britain to China. Prices must come down if more trade is to be done.

"These facts are set forth not in any croaking spirit, but with the sole desire that those interested in Great Britain will realize what is happening. Many believed that after the splendid organization of the munition factories in Britain the costs of production would go down so quickly that the factories 'at home' would be kept busy with orders from overseas markets. No attempt is here made to allocate the blame for the existing high prices. They

may be due either to labor, capital or to politicians.

"With these details the Chinese buyer is not concerned. He wants an inexpensive article, and although there have been times when he has gladly paid a high price to obtain British machinery, such occasions are scarce. When it is a matter of buying a lathe or drill, names of makers mean very little to Chinese purchasers, who know nothing of machinery, and therefore it is suggested that British machine tool manufacturers should give special consideration to the Far Eastern market. There should be a permanent exhibition of such tools in South China.

"All that one can hope just now is that prices of British machinery sale-

able in China will fall rapidly.

"It is true that large orders for British machine tools have been sent from South China to England since the war. They have been for tools for the local dockyards, the largest two of which are controlled by British subjects. Their advisers evidently persuaded the directors to pay the high prices in order to get the best article. It is said that one of the local dockyards has given orders for nearly a million dollars' worth of British equipment for its extensions and re-organization. Many other South China firms follow their most excellent example, for every patriotic Briton wants the workshops of the old country to be full of orders."

Another factor in the Chinese machinery trade which has a marked bearing on the success of German firms is pointed out by the Peking correspondent of The Engineer of London, who

says: "For some time there have been indications of considerable activity on the part of the Chinese who were associated in business with the Germans before the war. Germany is fast recovering her pre-war trade with China, and in doing so she is assisted by the methods she has adopted in closely cooperating with the Chinese. Germany always had many Chinese friends, both commercially and politically, and for the past three years they have jointly created sales and other organizations which have been the means of gradually restoring Germany's pre-war trade. It is undoubtedly a fact that most of the present German enterprise in China is an offshoot of the Stinnes syndicate, and the Germans are doing their business in such a way that competition amongst themselves does not exist. A surprising feature is their ability to finance most of the contracts they get and to give long credits -which the Chinese must have. As the Germans can no longer exercise extra-territorial rights in China they enjoy the same privileges as the Chinese, and in this way can own property anywhere in the interior. The Chinese law prevents the natives mortgaging their property to any foreigner enjoying extra-territorial rights, and under these conditions the Germans will benefit very considerably in the future. For instance, there are literally hundreds of such enterprises as mines, cotton mills, flour mills, electric light works, waterworks, etc., etc., which have already been organized, registered and sanctioned by the government, but have been unable to raise all the capital that is necessary to purchase equipment, etc. It is very often unsafe to sell machinery for such purposes on a system of extended credit unless ample security is provided quite apart from the equipment itself. This the Germans can and do get by an unqualified mortgage on the whole of the properties belonging to such a company.

"One often hears very pessimistic views about the inability of British manufacturers to compete with German prices, but most people forget that business in China does not always go to the lowest bidder. It generally goes to the firm from which the Chinese can get the best financial terms, and whilst in many cases a British merchant representing the manufacturer is willing to give easy terms of payment, he cannot obtain the sound security that he must have. There is not a single electric lighting scheme in China that does not pay handsomely, and most of them would yield even higher dividends if 'squeeze' were eliminated. In spite of this success there are hundreds of towns waiting for electric light and almost as many Chinese companies formed with a proportion of the required capital. These companies require the machinery on easy terms of payment, and the only people who can give it to them now are the Germans, who are willing to do so and take up debentures in the companies in lieu of payment. Arrangements can generally be made whereby a foreign chief engineer controls the operations of the company pending redemption of the debentures. In this way 'squeeze' can be reduced to a minimum.

"The question now arises: Is there a remedy for this state of affairs or are we to sit still and allow the Germans to capture the cream of the trade which we have had for so long? Nearly three years ago a charter was granted by the Chinese government to a group of British and Chinese interests which formed the Chinese-British Trade Corporation. Participation in this company was subsequently offered to British manufacturers through the federation of British industries, but it appears to have died a natural death through various causes. It is not too late to revive this company and out of it evolve a really workable organization. Under the terms of the charter it enjoys exceptional facilities for trading in the interior, and whilst it could not very well be used as a selling organization for a large and competitive group of British manufacturers, it could be used as a parent company from which workable selling concerns could be organized. The company, under its charter, has the right 'To finance, manage, undertake or participate in industrial and commercial enterprises of all kinds. To act as intermediaries or agents for the purchase or sale of securities, and for commercial and industrial business of all kinds. To deal in and hold stocks and bonds of all kinds.' It will be seen that many practical schemes can be evolved from such a charter, and now is the moment to re-open the question with the Chinese government."

Both of the above communications help to throw light on the present tendency of the machinery market in China. As pointed out by The Times correspondent, "the name of a maker means little to Chinese purchasers, who know nothing of machinery." For the reason that that they have absolutely no conception of modern mechanical appliances, and there is no way to convey an impression of what they are for in their own language, engineering advertising in Chinese is practically worthless. For many years we printed all advertisements in Chinese in a supplement for circulation in China. We employed the very best translators and the supplement was printed at the very best native press in China. Difficult as it is to translate foreign mechanical words into Chinese or even give them a Chinese meaning, once done, it is impossible to translate them back into intelligent English. Many manufacturers had these advertisements translated back into English by some student or linguist in England and America, and in some instances insisted on having them withdrawn. The same situation still prevails and we come back to the statement that successful engineering publicity in China and in other parts of Asia, can only be assured through the use of English, which enables the manufacturer to reach the foreign-educated Chinese, who, at least, has some idea of what the advertising is about. When to this class, is added the foreign-educated Chinese engineer, the limit has been reached in successful engineering publicity.

Foreign manufacturers who followed an intelligent publicity program in China, have been rewarded by an enormous increase in Chinese business. These methods, combined with political conditions which drew the Chinese towards Americans during and immediately after the war, were reflected in the trade returns, which show that they furnished 54 per cent. of the business in 1920. As a contrast to the complaints of the British, the report of Mr. W. H. Rastall, chief of the industrial machinery division of the U. S. department of commerce, traces the influence of political conditions on this trade, and shows the growth in value of the American connection. Since this report was written, there has been a considerable falling off in machinery imports, and such business as is now doing, is going largely to German firms with inside connections with the Chinese. This situation goes to emphasize that sentiment has no place in the Chinese make-up when it comes to business, any more than it has in any other country, and that the trade will gravitate towards the nation whose firms

can quote the lowest price and give the longest terms of payment. The failure of the Chinese to pay for much of the material ordered two and three years ago, from American firms, must be considered in connection with Mr. Rastall's report. It is also worth while to point out that many of the American firms who entered the field in 1919-20, and to whose activities are due to a large extent, the piling up of these orders, have since retired from the field, Americans have almost returned to pre-war conditions in the representation of machinery manufacturers in this market.

Mr. Rastall's report also emphasizes a situation that we invited attention to two years ago, in which a large share of the machinery shipments imported into China and credited to Japan, originates in the United States. Branches of over sixty of the largest Japanese concerns in New York buying direct from the American manufacturer for consignment to Japan where it is transhipped to China, creates a trade situation that must be reflected in figures of direct trade between the United States and China. Mr. Rastall says:

"The progress made by American machinery manufacturers in developing export business and the superior position of American engineering equipment in the markets of the world are shown very plainly by the experience in China since 1911, as is illustrated very forcibly by the tables published herewith. It should be noted that these data are from Chinese and not American sources, being developed from the returns of the Chinese maritime customs.

"Conditions in China have differed radically from those in the other markets of the world because business there has been influenced very strongly by political forces, as has been called to public notice in connection with the armament conference. It has been customary to specify in loan agreements that the machinery required shall be purchased in the country furnishing the money, with the result that the United States supplied China only about 30 per cent. of the machinery it imported in 1918, as compared with 80 per cent. supplied in the same year to Japan, which is and has long been an openly competitive market. Consequently it should be recognized that the progress indicated below has been made in spite of the difficulties encountered by those who sell machinery in China without financial assistance.

"The customs authorities in China always credit consignments to the last port of shipment, so that machinery built in the United States and shipped to China via Vancouver would be credited as from Canada. In recent years very important amounts of machinery have been shipped in that way, in fact, practically all of the machinery leaving Canada originated south of the boundary. Similarly, it should be remembered that the shipments from 'other countries' include not only machinery from Germany, but important shipments from Holland, Belgium, Sweden and other sources, although in the period prior to 1914 Germany was the most important of these sources of supply. The progress made shows a most astonishing increase in the volume of this business, making it worth while to submit the following figures showing the value of the shipments of the leading countries. These values are given in haikwan taels, the exchange value of which fluctuates very seriously, being worth about 65 cents in 1911, \$1.03 in 1917, etc.:—

Value in Haikwan Taels of Machinery Imports into China (excluding Agricultural, Embroidery, Knitting and Sewing Machinery.)

Year			United States and Canada Taels	United Kingdom Taels	Japan Taels	Total from all sources  Taels
1911			382,054	2,330,209	465,122	6,561,020
1912			179,803	1,762,916	388,475	4,704,485
1913			673,227	3,241,590	548,522	7,137,048
1914			681,170	3,749,149	852,934	8,157,270
1915			659,722	1,994,518	851,185	4,485,867
1916			1,078,530	2,350,903	1,991,031	6,131,258
1917			1,411,141	1,648,869	2,419,813	5,982,715
1918			2,390,332	1,313,604	3,569,909	7,860,290
1919			6,407,727	2,073,968	3,604,905	14,328,249
1920	* *	• •	12,181,382	5,229,026	3,727,604	22,536,254

"From the foregoing table it is evident that American machinery exports to China have increased 3,100 per cent. since 1911, and the American share of this business has increased from 5.8 per cent. (the lowest of the countries here mentioned) in 1911 to 54.1 per cent., or more than all others combined in 1920.

"Even this statement does not adequately describe the situation, because American machinery transhipped in Japan, especially for point in North China and Manchuria, is credited to Japan in the returns given in the table. Unfortunately, it is not possible to submit figures to show the volume of this transhipment business, but there is reason to believe it is very large, and during the war was strongly

influenced by the demand in Siberia for war equipment.

"What has just been stated refers to the experience covering all classes of machinery. If it is desired to be more specific, it is possible to submit corresponding charts regarding particular classes of machinery and a record of Chinese imports of textile machinery. For Americans the interesting part of the table is the comparison between the experience of the United States and the United Kingdom in this trade. The superiority of American engineering as represented by cotton-mill design and cotton-mill equipment has been clearly recognized in China, as also certain other countries, and it is anticipated that European designs will soon incorporate certain American features. The values involved in this trade are as follows:

Value in Haikwan Taels of Textile Machinery Imports into China.

Year		United States and Canada Taels	United Kingdom Taels	Japan Taels	Total from all countries  Taels
1911		7,161	241,234	60,159	331,582
1912		9,885	307,283	50,229	458,615
1913	 	2,615	672,150	112,500	839,724
1914	 	2,530	1,540,100	187,661	2,038,460
1915		15,446	1,076,229	253,490	1,419,511
1916		115,431	1,257,961	531,437	1,934,141
1917	 	218,928	669,649	302,607	1,235,800
1918		379,867	669,402	642,948	1,714,994
1919	 	1,944,350	813,254	897,760	3,767,406
1920		3,897,204	1,925,696	1,071,201	6,927,728

"It is thus very clear that the textile industry in China is growing very rapidly, and the American interest in the trade is making even more rapid progress."

### Up to Northcliffe

THE North-China Daily News has an uncanny habit of unearthing documents disclosing the inner working of Russian policy in Asia. Many years ago it set the chancellories of the world agog by publishing the text of the Cassini convention, a document which changed the whole aspect of Asiatic politics and compelled Great Britain to move quickly in order to defend her interests in India and elsewhere in Asia. The aftermath of this convention and its corrolary, the Li-Lobanoff secret alliance between China and Russia, was the Anglo-Japanese alliance, the Russo-Japanese war and the series of events which culminated in the twenty-one demands followed by the diplomatic blunders which nearly precipitated war between Japan and the United States.

Once again our contemporary publishes an epoch-making document, purporting to be the full text of the secret military convention between Soviet Russia and Republican Germany. As in the case of the Cassini convention, the authenticity of the document is in doubt, but it bears the earmarks of truth. In the event of its authenticity being established, history will undoubtedly repeat itself and Great Britain again make quick moves to counteract it, and unless we are greatly mistaken, the first of these will be a renewal of her discarded understanding with Japan.

By the terms of this secret agreement, Germany will equip, arm and entirely reorganize the Russian army. The German general staff will furnish the red army with the latest inventions in poison gas warfare, will build and equip new munitions and

aircraft factories, and the reds are not to interfere with the work of German officers and specialists on the new munitions factories on the border of Afghanistan.

No competent observer can fail to see that the reported secret convention is the logical aftermath of the Soviet's first surrender to Germany, and is strictly in line with the news that has dribbled out of both countries for the past three years.

History is being made while we write about it. It is safe to predict that the time is not far distant when those who were so active in discrediting Japan and bringing about the cancellation of the Anglo-Japanese alliance, will acknowledge the error of their ways. The Russo-Germanic pact leaves nothing to the imagination. It is now pertinent to ask; What will China be doing while Germany is building munitions factories on the borders of Afghanistan and developing the mineral wealth of the Altais and the Pamirs? What guaranty can China give to Great Britain that her territories in Tibet will not be violated when the time arrives for this new combination to place its plans in operation? Will the armies of Wu Pei-fu or some other Chinese general step into the breach and hold the new combination in check? When the time arrives, will those who defamed Japan, call upon her to come to the rescue?

The time may not be far distant when there will have to be a showdown on these matters. It is hardly probable that Northcliffe favors the new Russo-Germanic combine, and might tell us frankly how he expects British interests in Asia to be protected.

What is Japan supposed to do during the development of this new game of empire? Is Northcliffe willing to admit the danger to British interests in India, Persia and elsewhere in Asia? Will he frankly acknowledge that China is powerless to protect even her own integrity? Then he must be equally honest in expressing views about the necessity of Japan maintaining an army sufficient at least to guaranty her own independence. And if, in the development of the Russo-Germanic program in Central Asia, Britain's position in India and Persia is again menaced from the north, perhaps Northcliffe will be equally frank and honest in explaining just how big an army Japan will then be justified in maintaining?

Secretary Hughes has very firmly placed on record the American attitude towards the Soviet. The position of France accords with that of the United States. If the time ever arrives when Great Britain is placed with her back against the wall, there will be little sympathy wasted on those who by isolating Japan made possible such a calamity. The force of public opinion has influenced Japan to withdraw her forces from China and the Asiatic mainland. It may be a most difficult matter to persuade her to again set her legions in motion.

If this new alliance works out as they plan, there will be no combination capable of holding it in check except the Anglo-Saxons acting in concert with France and Japan. To quote the Rochester Post Express, "the next few years may see the government at Washington converted to the policy of permitting and encouraging the Japanese to occupy and hold Eastern Siberia against the German-Slav colossus and keep it out of China until that country is unified and able to defend itself." And the first to acquiesce in and urge such a policy will be those who have most active these past few years in discrediting Japan.

A big financial corporation has been organized by nearly forty leading companies of Germany, with the official approval and sanction of the central Soviet administration in Moscow, for the development of Russian industries. The capital of the corporation is temporarily fixed at one milliard gold marks, but it will be increased considerably in accordance with the commercial and industrial requirements of the vast Russian Soviet republic.

A remarkable organization for the promotion of German enterprise in Siberia has been created by the constitution, which is reported to have taken place at Vladivostok at the beginning of February, of the Far Eastern Russian-German economic association at the premises of the local chamber of trade and industry.

According to the details furnished by the promoters to the Vladivostok court of registration, the object of the association is to promote economic relations between German and Russian commercial and industrial circles, to establish regular business relations, and pave the way towards the productive combination of capital. It is proposed to establish exhibitions of samples of merchandise, prepare and extend lists of responsible firms, collect statistical data, give information of all kinds, endeavor to secure the re-introduction of patents and trade-marks, settle disputes, etc.

### The American Minister

IT was only natural that the clear-headed practical statesmen directing the present administration should live up to the standards set at home and select for the Peking post, a man worthy of the best traditions of the American diplomatic service. Seven years of futile sentimentalism, of batting around from pillar to post, of trying to accomplish the impossible, brought about a serious breakdown of American diplomacy in the Far East. The task of re-shaping American policy in this part of the world was one calculated to test the highest statesmenship of the nation.

Harding and Hughes rose to the occasion. The selection of Wood as governor-general of the Philippines, Warren as ambassador to Tokyo and Schurman for the Peking post, carried the promise that the days of sentiment had passed. With these three trained executives on the ground advising and collaborating with Washington, the president and secretary of state were enabled to re-shape American policies without sacrificing their essentials, and bring about a peaceful and satisfactory solution to the Pacific problems at the Washington conference. The days of hammering out and forming policies for action at the legations are gone. The tail no longer wags the dog. We have returned to the rational system of having national policies laid down by the state department and of appointing representatives who can be trusted with carrying them out for the ultimate benefit of purely American interests.

Jacob Gould Schurman is proving himself equal to the task he is expected to perform and has earned not only the commendation of Americans in China but the appreciation and good-will of the Chinese and his colleagues in the diplomatic corps. In swinging around the circle, visiting all the consular districts in China and gathering a first-hand knowledge of the problems that confront American trade, the American minister to Peking has equipped himself for real efficiency in his job. Americans feel that once again they have a champion whose opinions are not influenced by advisers in Peking working to have their own pet schemes given a monopoly of official support. In the short space of one year, the influence of the new minister has worked a marvellous change, and Americans throughout China are being brought together in a spirit of harmonious co-operation for the general advancement of national interests, a situation that seemed impossible of achievement two years ago under the partisan, and at times, arbitrary methods permitted under the past administration.

It is not our purpose at this time to write a eulogy of Minister Schurman. His reputation as a diplomat and statesman rests on a more secure foundation than his short tenure of office at Peking, where the first job he and his superiors had to tackle was the difficult one of finding a way out of the Oriental political labyrinth into which we had been led and abandoned by others. We are out of it at last, thanks to our new guides. The policies of the former incumbent of the post had so effectively closed the door against independent American financial activities in the development of China, that the only way we could participate at all was through international co-operation. The last administration created the new consortium in order to divert attention



Hon. JACOB GOULD SCHURMAN
American Minister to China
From a Sketch by Joel Madsen

from its own mistakes. It will tax the genius of the present administration to make it work.

Much has been accomplished since the new administration started in to straighten out the Far Eastern tangle. We are once more out of the woods and our feet planted on firm ground. Our guides have proven their worth, and we can look forward with greater confidence that these same leaders will find some way out of the consortium tangle that will once more elevate American diplomacy to its old time practical efficiency.

### The New Pacific "Entente Cordiale"

THE finest accomplishment of the present administration is the four-power pact. Signs are not wanting that the results of the Washington conference and the present trend of world politics will bind America and Japan more firmly together as time goes on. The Russo-Germanic combination is certain to have its effect upon the vital interests of Japan, and whatever differences of opinion may have strained American-Japanese relations in the past, these will disappear and Americans once more unite to morally and materially support the plucky island empire in whatever steps it may deem necessary to take in order to defend itself against such a formidable menace. Only good can come from such understandings, and these are being facilitated by such visits as that of the U.S. naval class of 1881 to Japan to hold their annual re-union as the guest of Admiral Uriu, a member of that class.

These visits will do more to restore good-feeling between the two nations that the usual exchange of high-flown oratory on the part of politicians. Much of the ill-feeling engendered between Japan and America was the direct outgrowth of agitation by politicians for political purposes. When soldiers and sailors, the fighting men of nations, get together in friendly re-union, it is a difficult matter for the politicians to start trouble. Men who to do the actual fighting are more likely to appreciate each other's qualities and become friends than political antagonists who use each other for selfish advancement. A few months since, General Tanaka visited General Wood at Manila. In return for the honors and decorations conferred upon General Wood and his party when they visited Tokyo, the American government conferred the distinguished service medal upon General Tanaka, to be presented while he was in Manila. The medal failed to arrive in time, and in making the formal presentation, General Wood explained the situation and taking off his own medal, pinned it on the breast of General Tanaka, saying that when the one intended for him arrived he would wear it himself. This delicate compliment did more to bring about friendly relations than years of official diplomatic correspondence. Tanaka returned to Japan enthusiastic about his reception and eulogistic in his praises of Wood. Tanaka says that Wood will be the next president of the United States.

In line with this fine feeling of comradeship, is the invitation of Admiral Uriu of the Japanese navy to his fellow-members of the class of 1881 at the Annapolis Naval Academy, to visit Japan this summer as guests of the Japanese government at a re-union in Tokyo. The cordial relations that are bound to follow will be far-reaching. If the fighting men of Japan and America occupy themselves with the relations between their two countries, their influence will neutralize that of professional agitators and trouble-makers, who, in both countries, have been far too active in recent years.

Nothing expresses American sentiment more clearly than the message of President Harding sent through the state department to the America-Japan Society on the occasion of the dinner at Tokyo in honor of the Japanese delegates to the Washington conference.

In commenting on this The New York Times says:

"The Japanese delegates acquitted themselves handsomely at Washington and enhanced the prestige of their country. They had made thorough preparation to discuss the articles of the agenda. They brought will them a well-informed staff of specialists. Feeling themselves suspected of Oriental

dissimulation to gain their ends, they disarmed criticism by frankness and by moderation. There was a dignity in their demeanor that commanded respect.

"No delegation showed more tact than the Japanese, and their courtesy was proof against misapprehension. It was their custom not to commit themselves without notice that Tokyo had been consulted. At all times they were scrupulous to be understood, and when they took a position, as when they made a stand for the warship Mutsu, they were ready to agree to compensations. In short, the ability and discretion of the Japanese were a revelation to their critics. So it is just as well as courteous that Secretary Hughes should have said for the president in the message to the America-Japan Society which was honoring Prince Tokugawa and his associates:

Highly appreciative of the great interest taken by these gentlemen in the success of the conference, the president would wish that he be permitted to share in the occasion by making through me his own acknowledgement of their sympathetic co-operation and of the considerate and accommodating spirit with which they participated in the many difficult questions confronting the conference.

"Previous to the Washington conference, talk of an entente cordiale with Japan would have had a ring of insincerity, but the spirit and the success of that historic meeting have brought about an improvement in the relations of the two nations."

### The China Trade Act

#### A Nigger in the Woodpile?

THE honorary secretary of the American chamber of commerce of China has been retained in Washington for sixteen months by the American business community of Shanghai for the purpose of pushing through the act providing for federal incorporation of American companies operating in China. Shortly after his return to Shanghai, the following editorial appeared in the Weekly Review of The Far East, of which the honorary secretary of the American chamber of commerce of China is editor and publisher:—

"American business in China has developed very rapidly since the beginning of the European war and, in some instances, has suffered from over expansion to such an extent that the present depression is causing embarrassment in many quarters. There have been elements of competition which have served to injure the whole American business position in this great overseas market. Every experienced American business man in China knows that the failure or withdrawal of one American firm of promise from this field not only injures the individual firm affected, but all American business in this part of the world. It is a matter of common knowledge that unfair competitive practices on the part of one firm injures not only those in the lines affected, but also all other lines of American business. Fraudulent practices on the part of one firm injures all, and worse, tends to bring all American business both domestic and foreign into disrepute in the eyes of other nationals. Competition for the trade of China is becoming keener and is tending to become national rather than individual. It is not our intentionto advocate a trust, for this would be impossible of organization or operation, but all will agree that there should be co-operation and co-ordination. That, at least, would remove the worst features of destructive competition. Some may suggest that this work of co-ordination should be handled by certain American governmental organs represented in the field, but this is difficult of accomplishment under the American democratic system, and would eventually cause congressional criticism. The job should be handled by the American business and financial interests themselves through some form of organization that would tend to eliminate objectionable features of competition without repressing individual initiative and effort. We admit that it would be a real job to bring this about, but there is always the right man for the job providing the place is made sufficiently attractive. After the right man has been found, he should be able to prove his worth and the general saving which he would be able to bring about would make his salary a mere incident, even though it reached the magnitude of that received by Mr. Hayes from the movie interests.

We can be excused for wondering what all this was leading up to. It was interesting to speculate upon the personality of this representative of non-competitive American business interests who would reside in Washington and practically dictate American policy in China. The casual reference to the salary of Mr. Hayes, the head of the movie trust (a mere bagatelle of \$150,000) opened our eyes to the possibilities of such a job and we have waited for further enlightenment on this brand-new idea. When the honorary secretary of the American chamber of commerce of China, made a speech before the American chamber of commerce at Tientsin, we were still puzzled to understand the meaning of the following statement:—

"There is not a soul in congress to plead the interests of business men in this part of the world. It would be worth many times the cost to have such a man on hand in Washington to represent American interests out here. Some of the wildest arguments are advanced in congress

about products from China and there is no one on the ground to dispute them. For example, one congressman made a long speech about disease in products from China. He built up a fine structure of argument based entirely on bunk. Interests having millions at stake in these matters have absolutely no one to represent them in Washington."

We scented a nigger in the wood-pile, and waited to see just how and where the Etheopian gentleman would show himself.

At the annual meeting of the American chamber of commerce for China its honorary secretary read a résumé of the amended Act as it would pass both houses and be signed by the president. Amongst other clauses was one which read "that at least one director of a China trade act corporation must reside in the district of Columbia!"

Examination of the act discloses that the "number, qualifications and manner of choosing and fixing the tenure of office and compensation of all directors of these China trade act corporations shall be fixed in the by-laws of the corporations themselves. In other words, each company may fix its own qualifications for directors, and with the law providing that one director shall reside in the district of Columbia, it means that the usual qualifications surrounding the election of directors will have to be materially modified. Naturally, no one company could afford to maintain a director resident in the district of Columbia, so if the law is to be complied with, several or many companies would have to combine to pay the salary and office expenses of such representation.

As matters stand, there are few individual American companies in China who could legitimately bear the expense of complying with this clause in the new law but it might not be difficult to follow the hint conveyed in the editorial appearing in the Weekly Review of the Far East and organize a group of non-competitive interests which could pay an interlocking director a salary commensurate with that received by the head of the movie trust. Granted that this can be done within the law, how about the outsider, the competitor who attempts to buck this combination with its \$150,000 a year director resident in Washington? Is this what the honorary secretary of the American chamber of commerce means when he advocates removing the worst features of destructive competition? Might not the elimination of objectionable competition include newspapers? We don't know how this phase of the clause appeals to other American firms in China, but we fully understand how the system might work in connection with our own business.

It would seem that hidden away in this clause of the China trade act lurks a fat job for one or two representatives of American trade interests resident in Washington, who would wield immense power, which could be employed very effectively against objectionable competitors.

There may be no connection between the editorial in The Weekly Review of the Far East, the speech of the honorary secretary of the American chamber of commerce at Tientsin and the clause in the China trade act providing for a resident director in the district of Columbia. It is difficult, however, to dissociate one from the other.

It is quite conceivable that such a plum will never be handed out to any ordinary individual, much less any American resident in China. It will be a big job and will go to some legal light whose knowledge of China is nil but whose political prestige in Washington is great. The China trade act provides that all corporations organized under its provisions may sue or be sued in the supreme court of the district of Columbia, thus making the director resident in Washington, for all legal purposes, a head officer of the corporation he represents. Naturally, such a personage cannot be bothered with details. He will require expert advice and guidance. The real head of the combination will be an assistant having a most intimate knowledge of the inside working of American business in China.

The main features of the China trade act will materially advance American interests in China. It should be enacted into law. The clause providing for resident directors in the District of Columbia, however, opens the door to the creation of a favored

combination whose power can be exerted to crush or stifle competition. With a full knowledge of how such power can be used, The Far Eastern Review will watch with considerable interest the working out of a clause which facilitates such un-American practices.

### The Situation in China

CHINA has passed through its seventh revolution in ten years, and from out of the wreckage emerges Wu Pei-fu as the new military dictator of Peking. A traitor in the army of Chang Tso-lin gave the initial victory to the forces of Wu in the north and the betrayal of Sun Yat-sen in the south gives the finishing touch to a campaign which elevates Wu to the top-most rung of the Chinese military ladder. Wu declares that his great aim is the unification of the country, the abolition of the tuchunate, to put an end to internal strife and the destruction of property and bring China back to the ways of peace. His praises have been sung daily by a chorus of Peking correspondents, and the world educated to look upon Wu, as the "Hope of China."

"The Hope," however, seems to be only one more in a band of tuchuns who have openly robbed the government and people for their own ends. Wu Pei-fu followed the precedent of Chang Hsun, but has been luckier than Chang in that he was early impressed with the value of publicity and of having a number of foreign writers on his staff of advisers. When Wu placed his army astride the Peking-Hankow Railway at Chengchow and exacted toll from its revenues and collected the salt taxes, in the same manner as Chang Hsun straddled the Tientsin-Pukow line at Hsuchowfu in earlier days, he was exonerated by the claque, because, as they explained, his intentions were good. Wu, they said, was a real patriot, resorting to these illegal methods only because the wicked government at Peking refused to supply him with funds. Wu was, therefore, justified in maintaining his army in order to drive the rascals out. The end justified the means.

Now Wu Pei-fu may be all that his press agents would have us to believe him to be, and if he can live up to the reputation set for him by admirers and maintain his ascendency, the chances seem bright for the rebirth of a benevolent military dictatorship on the lines of the one created by Yuan Shih-kai.

However, notwithstanding the reports of brilliant victories and the serene confidence of the small cheerful circle surrounding General Wu Pei-fu, it is becoming more and more evident that peace and unification are as far off as ever. From all accounts, Chang Tso-lin is still to be reckoned with, and as long as he sits tight in Manchuria there is little hope that the power of Wu Pei-fu will materially change the situation. Instead of being dictated to, Chang Tso-lin is in the position of dictating to Peking. Chang has advanced an argument difficult to ignore. When he talks about self-determination of the Manchurian provinces he is in a position from which he can only be moved by force of arms. His army is more or less intact and his financial resources remain as sound as ever. While Peking is at its wits' end seeking funds, Chang still has his group of Manchurian banks which can provide him with \$50,000,000 when necessary. Wu has proven himself a good soldier, but his ability as a statesman and administrator remains to be tested. His own party is split asunder and the members of the parliament swarming into Peking are reviving the tactics of other days, and seem determined to have things their own way in regard to posts and emoluments. It is entirely too early to assume that China is out of the woods, despite the optimistic statements of the small cheerful circle which surrounds General Wu and whose reports constitute the basis of most of the current news articles emanating from Paotingfu.

It is difficult to ignore current reports that Wu Pei-fu has the support of this or that legation, and that the ground is all prepared for the issuance of a great refunding loan, which, amongst other things, will consolidate his power in the same manner

that the reorganization loan of 1913 seated Yuan Shih-kai firmly in the dictatorial saddle. Such a loan might accomplish this end, but it would not consolidate China.

Until such time as a proper constitutional government based on a recognition of provincial rights and a limitation of the central authority is established, dictators will come and go and the nation or nations who finances any one military overlord, will learn to their sorrow that they have backed the wrong horse. The mere fact that



Wu Pei-fu, drawn by Juel Madsen

any one dictator is supposed to have the support of any particular foreign government is sufficient to set all other interests intriguing for his downfall. A régime which starts in by hounding out of China the two brainiest financial leaders of the country, who, no matter what their faults may be are true to type, no better or worse than their accusers, and which eliminates Sun Yat-sen by base treachery, cannot hope to inspire full confidence in its ability to perpetuate itself. If unification is ever to come to China, it cannot be made permanent by ignoring the man who stands for ideals which lie at the very foundation of successful constitutional government in this country. Nor can the Chinese nation be unified by the use of the armies of any one tuchun, super, ordinary or otherwise.

Had Chang Tso-lin emerged victor from the fight in Chihli, he might have staggered along for a few months or a year under the charge of being in the employ of Japan. Wu Pei-fu may last as long or longer, but if current stories have any basis in fact, he also, in the end, will have to go. When any one foreign minister or financier cherishes the illusion that the dictator of China is safely tucked away in his vest pocket, that particular dictator's tenure of power will be short indeed.

The Chinese have milked the foreign financial cow dry. Japan has been milked for many millions, If reports are true, Uncle Sam has also contributed \$50,000,000, which cannot be collected. Indications now point strongly to the intention of Peking to bestow its affections upon the British. It may be true and it may be false, but whether true or false, the Chinese will learn that there will be no altruism in any loan obtained directly or indirectly from British sources. The money, if lent, will be expended for the purposes for which it is intended, carefully supervised, and audited and the revenues for its security safely earmarked against any possible attack of aphasia on the part of future officials. Loans from England have their advantages. They are certain to be productive and create markets for materials.

#### "Playing Uncle Sam for Sucker"

This phase of the Chinese situation leads up to a brief reference to the series of articles entitled "Playing Uncle Sam for a Sucker" now appearing in *The Weekly Review of the Far East*. In this indictment of China, stress is laid upon the failure to pay her legitimate debts to American manufacturers for materials delivered, while making every effort to satisfy Japanese and European creditors.

There is only one observation we care to make on the situation described in the columns of The Review of the Far East, and that is, if the Chinese are playing Americans for suckers, the responsibility must be shared in large part by Mr. J. B. Powell and his co-workers. who, under the leadership of ex-minister Reinsch, started the campaign to flood the Chinese field with American firms in order to skim off the cream while the skimming was good during the Japanese boycott, and to build up an American business community in China whose mere weight of numbers would swing business to American manufacturers. We had occasion last year to invite attention to the disastrous consequences of this hip-hip-hurrah! method of advancing national interests in China, and to quote the commissioner of customs who officially declared in his annual report that the influx of a large number of inexperienced foreign firms into Shanghai precipitated the catastrophe which nearly ruined every trading firm in this port. American firms cannot be held responsible for responding to the official propaganda to induce them to enter the field.

Some time last year Mr. Guy W. Walker, a most rabid anti-Japanese propagandist, proposed to President Harding in a letter which we commented upon at the time (July, 1921) that the United States government take over all of China's bonded indebtedness to other powers in payment of an equal amount of what the allies owed to America. In other words, the United States was urged to become the sole creditor of China after which we were to question the validity of loans made by Japan and denounced as inimical to China's interests.

This proposition was very properly ignored, yet during the progress of the Washington conference it was again revived, this time by Mr. Thomas F. Millard. The newspaper comments on this scheme constituted the only reference to Mr. Millard's activities during the conference. It is difficult to dissociate Mr. Millard from the publication which still bears his name. It is appropriate, therefore, to invite attention to a scheme, which, if ever carried out, will place the United States in the position of being the biggest sucker that ever existed. If China is not promptly meeting her obligations to American creditors, who is to blame, the Chinese, or the people who led them to believe that Americans would fight their battles for them and relieve them of all financial indebtedness to other powers.

The Chinese are making it difficult enough for Americans to support their policies and create a sentiment favorable to the flotation of any loan on the American market for their financial relief. They certainly are not playing the game as Americans understand it, but they have the right to feel peeved when the Millard Publishing Company accuses them of playing Uncle Sam for a sucker after having led them to believe that the United States government

might be induced to manipulate a deal which would relieve them of all outside financial indebtedness.

#### Japanese-American Co-operation

As mentioned above, constant propaganda has created the impression that in some way or other, not fully explained, the British group in the consortium will either take the initiative in negotiating a refunding loan or operate independently in financially supporting the Wu Pei-fu régime. It has been difficult to reconcile these reports with the consortium understanding, and, if true, would indicate that the British group was prepared to go it alone. There is nothing to prevent such a loan, if the other groups decline to participate. We have refused to give credence to these reports believing they were simply expressions of wishes that were father to the thought, proof in our mind that Peking had come to the end of its financial rope, and was now endeavoring through subtle propaganda to create dissentions amongst the banking groups that would lead to a cancellation of the consortium agreement.

The situation seems to be that China can expect no assistance in the shape of independent loans from Japan. The Japanese are not likely to play the financial fool for the sake of bolstering up any temporary dictator in Peking. The Chinese have exhausted their credit in Japan. Over \$50,000,000 are owed by China to American firms, and those who have reposed the blindest faith in her honor are hit the hardest. We quote from The Wall Street Journal of November 4, 1919, when the original Continental and Commercial Trust Company loan to Peking was placed on the market for renewal. Mr. J. J. Abbott in an interview given out in Chicago, said:

"I would trust China without any security, but it has been the custom of that country to supply such protection."

Coincident with the above declaration of absolute faith in China's financial honor, Dr. Paul S. Reinsch arrived in the United States to enter upon his duties as chief adviser to the Chinese government. In one of his first interviews on arrival at San Francisco as reported by the Associated Press on October 23, 1919, he declared:

"And remember, that China is one of the very few big powers which is absolutely solvent and can pay for what she buys with spot cash if she so desires."

Can American business men be censured for taking these leaders of finance and diplomacy at their word? Is it any wonder that the warning of lesser lights was ignored when such propaganda was put out to induce Americans to "invest in China" and get aboard the band-wagon that was then being paraded up and down the cities of the United States, heralded by a brass band of newspaper publicity, such as was never given to Barnum in his palmiest days?

At the time, we strongly denounced such broad statements, calculated to unduly enhance the credit of a government existing solely for the purpose of finding funds to perpetuate the rule of rapacious tuchuns. Over two years have passed. Mr. Abbott's loan came up for payment in November last. The interest and principal was defaulted. Manufacturers of railway and other materials accepted Minister Reinsch's declarations at their face value and eagerly booked orders the Chinese forced upon them. They are now whistling for their money. The pendulum has swung the other way. China's credit in the United States stands below zero.

Business conditions in China are worse than ever. In commenting on this phase of the situation The North-China Daily News says:

"Merchants of wide experience in Shanghai make no secret of their opinion that not even in the strenuous days of the revolution did matters come to such a pass as at present. Ships arrive in port bringing valuable cargoes, but the Chinese dealers who act as the purveyors for the interior are unable to put their cargoes into consumption. They must be warehoused here or elsewhere, eating up money through interest charges and perpetuating the dislocation of trade. No ray of light appears to penetrate through the

gloom, nor will there be until Peking effects such a settlement as will promote confidence sufficient to trade on.

So much for the needs of private business. The business in which the government itself is interested deserves equal consideration from those consulting on affairs of state, for in different parts of the world manufacturers and engineers must be paying unusual attention to Peking's capacity, or lack of it, for ordinary business affairs. The contract for the Yellow River Bridge was awarded a considerable time ago, and since then nothing has happened. A firm in Europe was recently given the work of constructing a number of locomotives for government railways, and progress has now been made thereon to the point where the first instalment of money can be called for. An unhappy rumor is current in the capital that it is not forthcoming. Only the other day the contracts for the Peking tramways were announced, but people regard the whole project sceptically: in the present condition of things they believe the trams are hardly likely to be seen for many a long day."

With the financial markets of Japan and America barred against independent Chinese loans, it was only natural that the latter should start a flitation with the British. But the British many ages ago graduated from the kindergarten class in these international financial matters, and while they may smell around, nibble and investigate, they are too wise to swallow the hook and be landed in the Chinese net. If there is any sucker to be caught, it will not be hooked in the Thames.

Present conditions indicate, that sooner or later, the Chinese must come to the consortium for relief. If, however, current reports should prove true, and British money is loaned to Peking directly or indirectly, it is not very difficult to prophecy the future.

It is preposterous to harbor the idea so carefully propagated, that the British will come to the financial rescue of Wu Pei-fu, but if the incredible should come to pass, a similar unbelievable situation would surely follow. Japan and America would be brought together in a co-operation so harmonious that it would materially change the entire situation in the Far East.

### Keeping Peace on the Pacific

#### Cheap Radio Essential

ELSEWHERE in this number of The Far Eastern Review will be found articles dealing with the Pacific radio situation and the growth of radio activities in Japan. Since the first article was written we learn that the service of the U. S. naval radio for press dispatches is to be continued until July, 1925. It seems unfortunate that this service to the Pacific press cannot be made permanent, as the commercial cable and radio rates between Pacific countries are prohibitive to the sending of any press dispatches save those of the most sensational character. We agree with the Pan-Pacific union that a six-cent a word press rate to any part of the Pacific via government radio would have meant the assurance of continual goodwill, which for the next ten years, is a guarantee of permanent peace in the Pacific.

Spurred on in part by these low radio rates, the United Press is entering the Pacific field and hopes to loop up a news service between all Pacific lands. Unburdened by any contracts with European press services to keep out of any Pacific territory the United Press has a free hand. It is understood that a drop service will be established at Honolulu where it is proposed to gather and disseminate radio press messages from and to every part of the Pacific.

With so much money being expended in the United States to keep the people amused and informed by free radio broadcasting, it would seem that some attention might be given to a service upon which depends to such a great extent, American trade and prestige in the Pacific.

The United States government from its army and naval radio stations sets free daily wonderful musical compositions that anyone, amateur or professional, may receive and listen to if he but has a wireless outfit or access to a receiver connected with one.

The U.S. government serves the press of the American Pacific with news sent out through its naval raio stations at a minimum cost. Should the other governments of the Pacific be willing to

reciprocate, a six-cent a word press rate could and would be established between any two countries of the Pacific. Such a press rate now exists between San Francisco, Honolulu, Hawaii, Tonga, Samoa, Unalaska, Alaska, Guam and Manila. The result was that Honolulu on the most isolated group of islands in the world, received and published daily the full proceedings of the great conference in Washington. There was no misunderstanding.

Japan, China and Australasia refused to receive the radio press messages distributed by America, with the result that often dispatches during the conference were days late in transmission and on several occasions so garbled as to almost bring about in-

ternational misunderstanding.

From Washington it cost six cents a word or less to get news to Honolulu or Manila. It cost from thirty to sixty cents a word, press rate, to get news to Japan, China or Australasia, and this was practically a deferred rate, subject to a delay of twenty-four hours or more. It cost triple commercial rates, or from one to three dollars a word to get quick cable service to the Orient or Australasia.

At Guam when six cents a word press messages were received, these might be relayed by government radio to Manila, but the messages destined for Japan had to be taken by auto across the island to the Japanese cable office to go over a congested cable.

It was hoped that during the Washington conference all this would be adjusted, and at one time there seemed to be every hope that it would be. Now it is necessary for the Japanese and American ambassadors to get together and suggest an amendment to our treaties that will permit Japan to receive and send press

messages to and from her government radio stations.

It is because of these unfortunate restrictions on the free and unhampered distribution of news between Pacific lands that the Pan-Pacific union of Honolulu is urging that each government send a delegate to the next conference who is well posted on communications. As it is now only sensational items are sent at the present high and all but prohibitive press rates that exist because of the lack of understanding and co-operation.

The Pan-Pacific union believes that the governments of the Pacific can safely be trusted to set free daily authentic news of the happenings in their respective countries. At any rate this subject might well come up for expert discussion at the Pan-Pacific com-

mercial conference next October.

Here is a proposition that should meet with the unqualified approval of every American in China and Japan, the assurance that through cheap communications for press publicity friendly relations may be perpetuated with all Pacific countries. If millions can be expended for amusement and advertisement at home, some attention ought to be given to the more serious needs of trade and future relatons with China and Japan. It is to be hoped that the branches of the Pan-Pacific unions in China and Japan, the American chambers of commerce and other bodies will get behind Alexander Ford at Honolulu and work for the success of such a worthy program.

### For a Better Consular Service

A CTIVITIES of the diplomatic and consular services in behalf of American business interests were described by Secretary of State Hughes, in an address at the concluding session of the annual convention of the chambers of commerce.

The state department and the department of commerce, Mr. Hughes said, are co-operating in their activities in a most satis-

factory manner.

"I shall make no apologies for asking not only your support but your active and urgent demand in the interest of American business for the maintenance and development of the most efficient organization of our diplomatic agencies," said Mr. Hughes. "The truth is that our foreign service is undermanned and under-

paid. Of course, in the department of state, as in other depart. ments, we are most deeply interested in economy and reduction of unnecessary expense. At this time with vast burdens resting upon our people as a result of the war, all avoidable outlays should be rigorously cut down and the department of state has done its full share. Let me call attention to the fact that the expenses of the entire service of the department, including the diplomatic and consular services and that of the department in Washington amount to less than \$11,000,000. Indeed, under the present schedule of passport fees, which I shall be glad to see revised and reduced, for the last fiscal year the receipts of the department ex. ceeded the total expenditures of all services by over \$1,270,000. In other words, it was a money-making institution. I am not. therefore, asking outlays which threaten the taxpayer with any serious increase of his heavy burden. A relatively small amount would be sufficient to give the equipment that is needed to provide the essential basis of a career and thus to keep trained men in the service of the government.

#### Diplomacy and Commerce

"There has long been too great a distinction between the political interests of the diplomatic service and the commercial interests of the consular service. Both are engaged in political work and both are engaged in commercial work. You cannot at this time take economics out of diplomacy. If you would protect your interests on the one side you must support them on the other, and I believe that the two branches of the service, now called the diplomatic and consular, should be drawn together and treated as an interchangeable unit. This would permit men to be assigned from one service to the other and thus give a greater range of opportunity for putting men in the places where they belong, as their aptitudes and special talents are revealed.

"In all these matters we must be realistic and not permit our mental processes to be stopped by archaic differentiation. Nearly all nations have found it necessary to make a considerable reorganization in order better to equip their foreign service, and this country should not lag behind.

"There should be a co-ordination of effort among the different departments of government. Sometimes it might be supposed that the different departments of government were so many different governments, such has been at times the nature of the intercourse between them. While we are intent upon perfecting any particular agency of government we can never afford to lose sight of the fact that it is a single government whose varied instrumentalities we are considering and which must act as a single government with a unified purpose and method.

#### Departments Co-operating

"I am glad to say that we are achieving at this time a very gratifying measure of co-operation among the departments; in particular the relations between the department of state and the department of commerce are most cordial and mutually helpful. We are working with each other and endeavoring each to aid the other in its recognized field of effort. It is my most earnest desire that all practicable measures shall be taken to promote American commerce and disseminate through all appropriate channels the essential information which the American merchant needs.

The department of state is carrying the flag of the twentieth century. It aims to be responsible in its own essential sphere to what it recognizes as the imperative demands of American business. It aims at the co-ordination of the work of all departments bearing upon the same great object of American prosperity. It intends in its contacts with foreign governments to maintain the American tradition of candor and good faith and at this difficult time it is earnestly desirous of aiding in the re-establishment of stable conditions and thus of contributing to the welfare of other peoples upon which our own prosperity must ultimately depend."

## Keeping Peace on the Pacific

Protest Against a Radio Monopoly

NE of the most vital requisites to permanent peace and good understanding on the Pacific is a cheap and efficient news-service, either by cable or radio. Pending the establishment of adequate commercial radio facilities, it devolves upon the American and Japanese governments to permit the use of their naval and other official radio stations for the transmission of news matter at the lowest possible rates consistent with good service. This is, perhaps, one of the most important questions before the newspapermen of both countries to-day, for unless some such practical solution is found, American newspapers will have to depend to a large extent on

British sources for news from the Far East. Americans should have their news of the day from this part of the world presented to them without coloring or editing from the many special pleaders and propagandists who in most cases monopolize the sending of Far Eastern news. Peace with understanding is dependent upon the outcome. If the results of the Washington conference are to be permanent; if the Pacific Ocean is to remain true to its name, the next ten years must witness a complete rapprochement between Japan and America, with a more intimate knowledge of Chinese and other Far Eastern problems. Not only is this essential for promoting peace and goodwill, but for the proper development of trade.

That energetic organ of American newspaperdom, The Editor and Publisher, has been conducting a strenuous fight for the passage of a bill that will extend for five years the use of the American naval radio facilities in the Pacific for news dispatches. The opposition forces are taking the stand that the government is being placed in the position of competing with private industry, but in refutation of this, it has been pointed out that unless the naval radio is used the service

will have to be discontinued, so in view of this fact there could be no competition.

Another argument of the opposition is that set forth by the Radio Corporation of America, which contends that a five-year extension will seriously interfere with its marketing of securities to raise funds with which it says it plans to extend its facilities. Representatives of the corporation told the senate naval affairs committee that they were not opposed to a two-year extension, but they claimed if congress authorized a longer period, it would interfere with their plans. They could give no assurance that they would be prepared to handle the press business in two years, but said that if they were not, they would not oppose a further two-

year extension. They could not, however, give any assurance as to the rates that would be charged. And in this connection, attention has been directed to the fact that the Radio Corporation of America would have a monopoly on the business and could charge whatever it desired.

The campaign of the American editors has been indorsed in a petition signed by the leading newspapers and news agencies of Japan for presentation to the Minister of Communications, requesting that the Japanese navy radio be utilized to permit news transmission at a low rate per word. Attention is called in the document to the rate of a few cents charged between New York

and European cities, and that rate contrasted with press rates of 27 cents for wireless and 32 cents for cable dispatches in effect between San Francisco and Tokyo. "If the present situation is not improved," the petition declares, "the result will be harmful to the interests both of Japan and America."

There is every reason to believe that the project aimed at lower trans-Pacific press rates will be successful. The Japanese government is known to be willing to grant the use of its naval radio facilities. An agreement which exists between the ministry of communications and the Radio Corporation of America ostensibly would prevent the use of government stations for this purpose but, in view of the fact that the service given the newspapers would be temporary and intended only to bridge over the period until increased facilities permit the private companies to handle news dispatches at a reasonable rate, the Radio Corporation is expected to give its consent. This company's business in Japan is conducted through the imperial government telegraph bureau and the ministry of communications, and statements already issued by officials in these departments indicate that the Radio Corporation's agree-

Underwood and Underwood

OWEN D. YOUNG

Vice-president of the General Electric Company, who, at the instigation of Admiral Bullard, conducted the negotiations which put American commercial radio entirely in American hands.—World's Work

ment will not be an obstacle to the proposed co-operative arrangement.

In view of the importance of this measure for the advancement of international friendship, it would seem that some compromise might be effected along lines that would not unduly interfere with the success of the Radio Corporation in marketing its securities. On the other hand, there is every good reason why editors and publishers should oppose any plan that might ultimately lead to the practical monopoly of any company in the transmission of Pacific news. What the nations of the Pacific need, and need quickly, is cheap communication, to break down prejudices and racial ill feeling. We have ten years to work in before the expiration of the

period of naval limitation. If the Radio Corporation of America cannot give the assurance needed at this time as to when it will be able to take over commercial business at reasonable rates, then it would seem that the higher interests of the nations and peoples concerned demand that the extension of the use of the American naval radio for cheap newspaper messages be granted by congress. The cause of peace and good understanding should not be made subserviant to the requirements of private capital, no matter how worthy and patriotic their motives. In this one matter of cheap press dispatches, it is clearly up to the governments of the United States and Japan to leave no stone unturned, to stop at no cost, in order to complete the first great step towards mutual understanding resulting from the Washington conference.

No comment on the radio situation in the Pacific would be complete or just without some reference to the great work already accomplished by the Radio Corporation of America for the advan-

cement of nation interests. In this, the credit goes largely to an admiral in the navy and his assistant in charge of naval communications. We cannot do better than reprint the editorial from World's Work which reveals for the first time something of the activities of these two naval officers which broke the European radio monopoly and permitted an American company to enter the field.

Rear-Admiral William H. G. Bullard of the United States navy and his assistant, Commander S. C. Hooper, performed a very valuable service to the United States of which people have heard little. As a people we are accustomed to expecting much from the army and navy without special reward, and curiously enough the traditions of those services are such that we commonly get what we expect.

Admiral Bullard's case is a very good example. It was owing to this officer's energy and foresight in doing more than his duty that the United States now has, in American hands, the most effective radio communication of any nation.

With the exception of Marconi, almost all the great names in radio, Fessenden, de Forest, Squier, Pupin, Armstrong, etc., are Americans, yet by 1919 British commercial

enterprise and finance had secured a dominant position in radio communication all over the world. As British enterprise had done the same with cable communication, an American invention, the United States was largely dependent upon British companies for its communication with the rest of the world. As late as the beginning of 1919 the Marconi companies were dominant in the radio field all over the world. There were several Marconi companies including an American one, but the British Marconi Company controlled them all. In building up their business the Marconi companies were negotiating with the General Electric Company for some high-

speed alternating current machines for sending, designed by Mr. Alexanderson, one of the engineers of that company. The negotiations had been interrupted by the war. During the war the General Electric Company, being unable to find a market for these machines, had set up two of them at its own expense as a demonstration at the New Brunswick station of the American Marconi Company.

This station had proved particularly effective when taken over and operated by the navy, Admiral Bullard being then chief of communications. The war being over early in 1919 the negotiations were again in progress with the Marconi Company, and all but settled when Admiral Bullard got back from Paris.

On April 4, 1919, Mr. Owen Young, vice-president of the General Electric Company, got a telegram from Admiral Bullard asking him not to sign the agreement with the Marconi Company until the admiral had a chance to see him. The next day the admiral and Commander Hooper reached New York. The admiral urged the General Electric Company as a patriotic American concern

not to sell its apparatus to foreign companies and thereby impair the possibility of forming a strong enough American company to meet foreign competition.

#### An American Company

It was pointed out to him that the General Electric Company had spent a great deal of money on this apparatus, that it was a manufacturing company, not a radio company, that it could sell to the Associated Marconi Companies and that there was practically no other customer. But that did not discourage the admiral. He persuaded the General Electric Company to have the courage of this convictions and to try to form an American radio company and sell its apparatus there. He promised to try to get for such a company, government support; and he did try and nearly succeeded.

However, by this time the General Electric Company had gotten a firm hold on the admiral's convictions and proceeded regardless of the failure to get government support. The first essential was to get control of the American Marconi Company. Mr. Young went to England and persuaded the British company to sell its interests and to make satisfactory traffic arrangements with Likewise the French Marconi

the new American concern. Likewise the French Marconi Company agreed to sell the Tuckerton, L. I., station to the Radio of America, as the new company was called. By these negotiations the Radio Corporation came into possession of all the high powered sending stations in the United States except the government stations, and had, moreover, favorable traffic arrangements with the companies in Europe.

Then the problem was to develop the facilities both commercially and technically as rapidly as possible. To this end Mr. Young sought the aid of the American Telephone and Telegraph



Underwood and Underwood

REAR-ADMIRAL WILLIAM H. G. BULLARD

Whose visit to the offices of the General Electric Company on April 5, 1919, began the sequence of events which ended in American control of commercial radio in this country and in the dominance of the American interest in the South American field.—World's Work

Company which, beside its great experience in selling communication, had also done a great amount of investigating in the radio field. An arrangement was made whereby the Telegraph Company and its manufacturing subsidiary, the Western Electric, made all their patents and investigations available to the General Electric Company and for use by the Radio Corporation; and in return the General Electric made all its patents and devices available for the Western Electric and the Telephone Company, it being agreed that the Radio Corporation should not use these licences in the telephone field and the Telephone Company should not use the licences it received in the commercial field except where it supplemented the telephone system.

#### Backing of Strong Firms

So at the instigation of an admiral in the navy an American France and across the Pacific.

radio company came into being, and under the management of Mr. Young it acquired the backing not only of the General Electric Company but of the Telephone Company as well, and later the Westinghouse Company made its patents and devices available for the Radio Corporation also.

On April 4, 1919, the Radio Corporation existed only in the brain of Admiral Bullard. On December 1, 1919, it was ready for business. On March 1, 1920, it received the stations from the hands of the government. It is now the largest and best equipped commercial radio company in the world, is American run and American owned, and provides the United States with American-controlled communication with the rest of the world. There are now five circuits—to Great Britain, to Norway, to Germany, to France and across the Pacific.

## Radio Development in Japan

H. C. Huggins

Marconi's experiments with wireless communication, and stimulated by this, the department of communications at once began an experimental study of radio, quite independent of the Marconi inventions. Details of the Marconi experiments were kept a profound secret, and under the circumstances the department found it extremely difficult to manufacture the necessary apparatus. By the summer of 1897, however, the department of communications had succeeded to such an extent that experimental communication between Tsukishima and Shinagawa, a suburb of Tokyo, were successfully carried on.

Ever since 1897 the Japanese government departments have been engaged in profound researches into wireless problems, and great progress has been made, despite the fact that all use of radio has been jealously monopolized by the government, and independent investigation has not been permitted until recently.

In 1900, communication between Tsudanuma and Yahata, some 10 nautical miles was opened, and at the same time two stations at Yawata, Kazusa province, and Otsu, Sagami province, 29 miles apart, were successfully operated. Thereafter from Funabashi, Shimosa province, to Otsu, Sagami province, 34 nautical miles, communication was effected and regularly maintained.

The technique of the department's system improved every year, and is now known in Japan as the "Teishin-

Arc Generator made by the Nippon Radio Company

sho" (the system of the department of communications). In 1903, in fact, wireless communication, using 'the "Teishinsho" system, was opened between Nagasaki and Formosa, 630 nautical miles, proving that the Japanese system is as practical as any of the others now in use throughout the world.

Some of the inventions which have made the "Teishinsho" system a success are listed in the following table:

Name of Invention Year Granted Inventor
Radio wave detector ..Dec. 16, 1904 Osuke Asano
Radio wave detector ..March 19, 1907 Mitsuru Sayeki
Radio sending system ..Oct. 7, 1907 ,, ,,

Tantalum detector ..Oct. 21, 1908 Yuichi Torigata

Receiver mineral detector . . Dec. 8, 1908 ,, ,, Sharp cone mineral detector May 18, 1909 ,, ,, and Eitaro Yokoyama

Radio telegraph and tele-

Radio telegraph and telephone receiver ... ... June 3, 1909 Mitsuru Sayeki

Extra high-tension dry condenser ... ... July 22, 1909 ,, ,,

Radio detector for telegraph and telephone ... ... July 22, 1909 ,, ,,

Wave detector for wireless telegraphy ... ... Sept. 8, 1910 ,, ,,

Radio sending and receiving apparatus ... ... ... Aug. 22, 1910 Yuichi Torigata Enamel covered condenser ... Nov. 24, 1911 ,, ,,

Quenched spark gap for wireless telegraph and telephone ... ... Feb. 10, 1913 Mitsuru Sayeki and

Sound proof arrangement for spark discharge . . . . . . . . . Dec. 12, 1913 Mitsuru Sayeki and Yoshio Yoshida

Simultaneous sending and receiving apparatus for radio telephone and tele-

graph .. .. Dec. 17, 1913 Eitaro Yokoyama

Current intensifying arrangement for spark discharge. Sept. 13, 1918 Mitsuru Sayeki, Yoshio Yoshida and Kumanosuke Ko-

Multiplex telephone and telegraph wire for radio ...March 8, 1920 Yuichi Torigata, Masujiro Kitamura,

sujiro Kitamura,
Noboru Maruke,
Teijiro Horie and
Eigoro Tsunobu

yama

Kumanosuke Ko-

High frequency telephone and telegraph apparatus. April 14, 1920 Same inventors as above

Wave sending apparatus for radio telegraphy . . . March 2, 1920 Masujiro Kitamura

During these early years of experiment the navy department realizing the value of wireless, requested the department of communications to lend some of its experimenters and operators to the navy, so that it might take advantage of the successful results of any of the department of communications' experiments. The fact that the sentinal ship Shinama Maru, at the time of the battle of Tsushima, in the Russo-Japanese war, was able to report by wireless to Admiral Togo, "We have just sighted the enemy's ships," is one of the historical instances of the value of the application of researches of the department of communications.

In 1903, successful wireless communication between Great Britain and the United States was established by the Marconi system. This led to the first international conference on wireless

in Berlin. Japan sent delegates both from the department of communications and the navy department, and subscribed to the articles of the treaty negotiated there. Japan also became a party to the treaty negotiated at London in 1912.

The first wireless stations for the transmission of public messages in Japan, were opened in 1908, at Choshi, Tsunojima, and Ohsesaki; and seven steamers flying the Japanese flag, including the Tenyo Maru of the Toyo Kisen Kaisha, and the Tango Maru, of the Nippon Yusen Kaisha, installed wireless apparatus that year. Some years later, the station at Choshi, and the new station at Funabashi were regularly broadcasting meteorological observations and time reports.

Since 1908, the number of Japanese merchant vessels carrying wireless has increased to 394, while there are 15 non-military land offices under the jurisdiction of the Japanese government. Among these, the Iwaki station is one of the finest in the world.

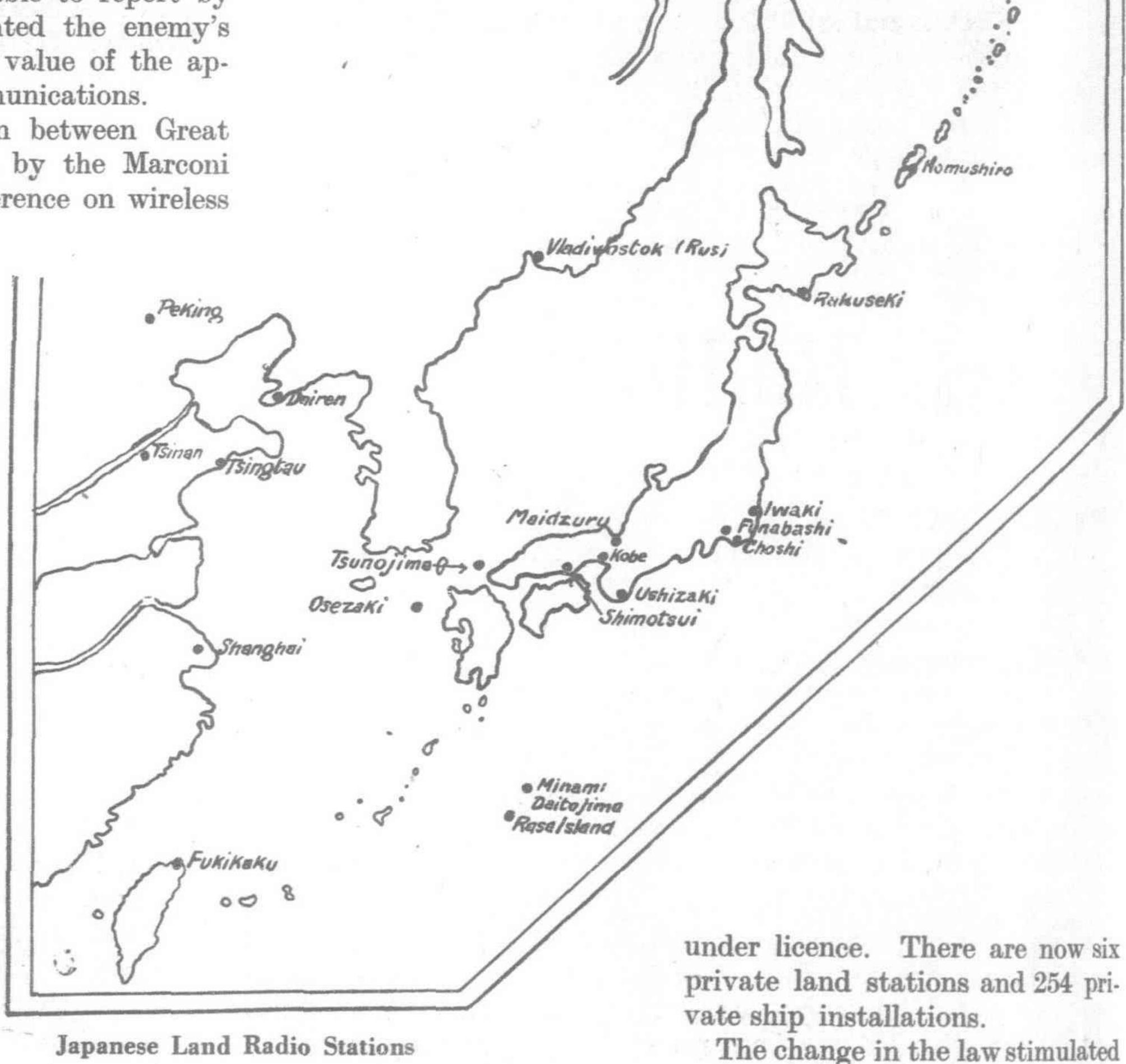
The Japanese stations now operating keep Japan in direct communication with the United States and Canada, and the coast of Asia.

The United States was the first country to make obligatory the installation of wireless equipment on board steamers. Event-

ually an international agreement to instal wireless on all passenger ships was reached. Japan, however, was prevented from placing this law in complete operation because of the shortage of apparatus caused by the European war. But during the past few years Japanese companies have taken up the manufacture of wireless apparatus, and the shortage is being made good by homemade equipment. Consequently the time is not far distant when all Japanese ships will be equipped with wireless.

Naturally, Japan lacks competent operators. In order to remedy this, the department of communications has laid down rules for the examination of candidates for licences which permit private schools to train students as radio operators on Japanese vessels.

Up to 1915, the conduct of wireless was regulated by the provisions of the telegraph law. This law was too restrictive in its application to private activities, so in 1915 it was changed, and for the first time, private owners were permitted to establish wireless stations,

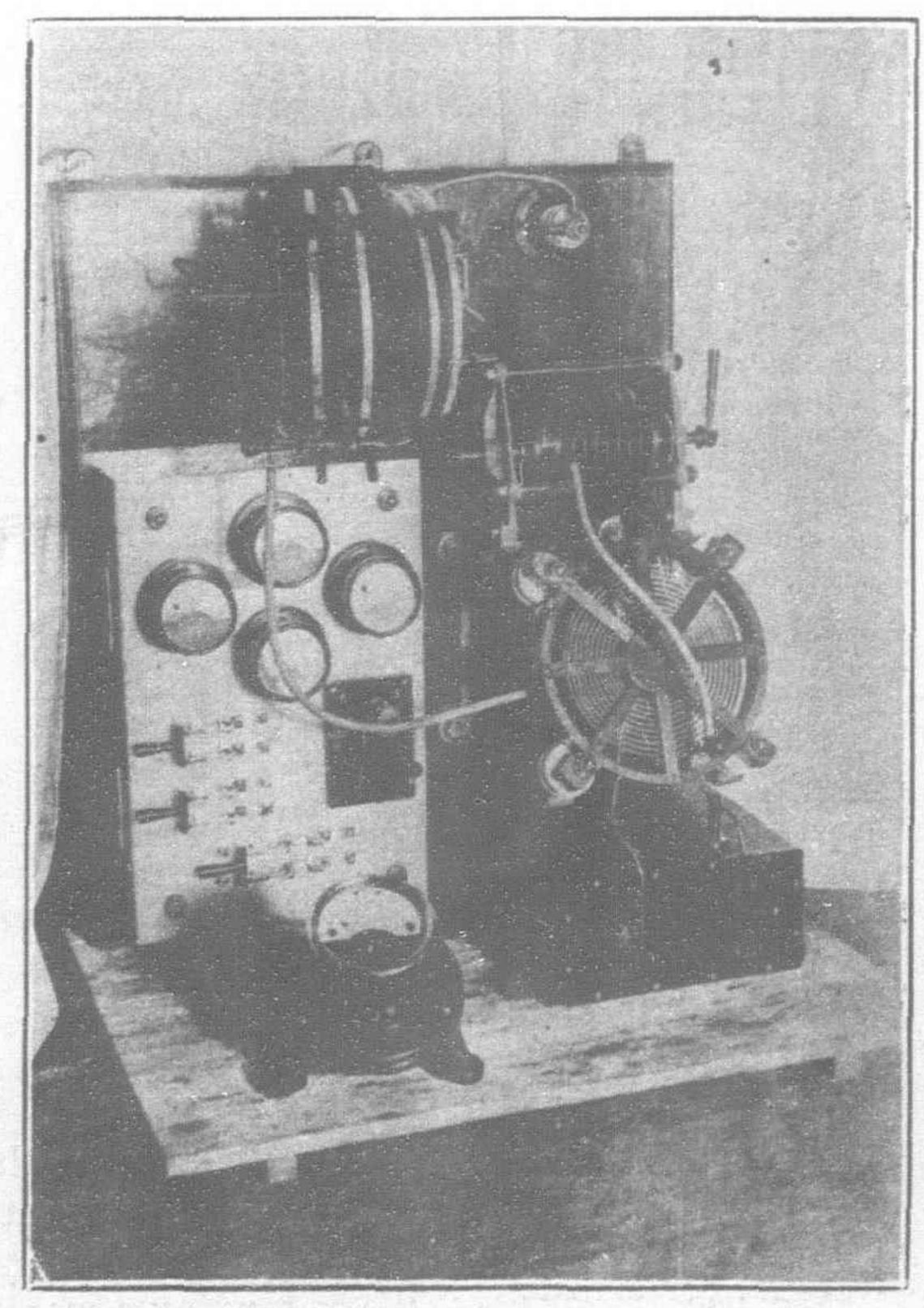


the organization of companies to manufacture wireless apparatus. The Nippon Musen Denshin Denwa K.K., and the Annaka Denki K.K., were pioneers in this field, which is still restricted to less than ten companies of importance.

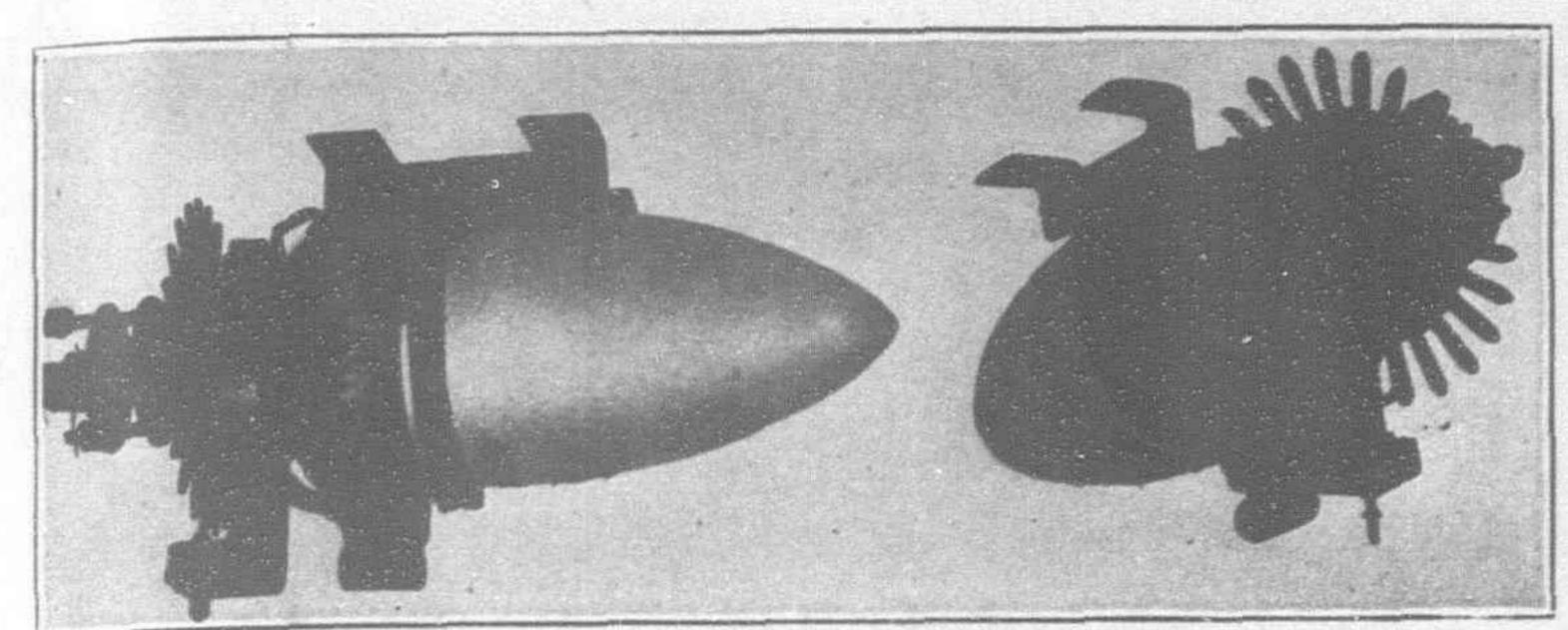
In 1912, during an interruption of the cable service between Japan and Taiwan, wireless service was first established from the main island of Japan and Formosa (Nagasaki is in Kyushu, which is not the main island of Japan). In June 1915, an office was opened on Rasa Island, connecting Japan and Rasa. Japan's first international wireless communication was begun in 1915 when an office at Ochiishi, Hokkaido was placed in communication with another at Petropavlosk, in Kamchatka.

In 1916, the Funabashi station opened communication with Hawaii, and this proved a great assistance in establishing communications between the United States and Japan. With the completion of the Tomioka receiving station at the Iwaki office, in May, 1920, a double line of communication with the United States was opened. Its area of communication includes Hawaii, the Pacific coast of the United States and Canada, and connection can even be made with New York.

Following the example of the rest of the world, Japan's engineers have



Wireless Set for Trawlers made by the Nippon Electric Company



Sending Apparatus for Aeroplane Wireless made by the Nippon Radio Company

been busily engaged in wireless experiments, in an endeavor to perfect a system for long-distance communication. The Haranomachi station which will soon be completed will embody the latest of the improvements made by the Japanese engineers.

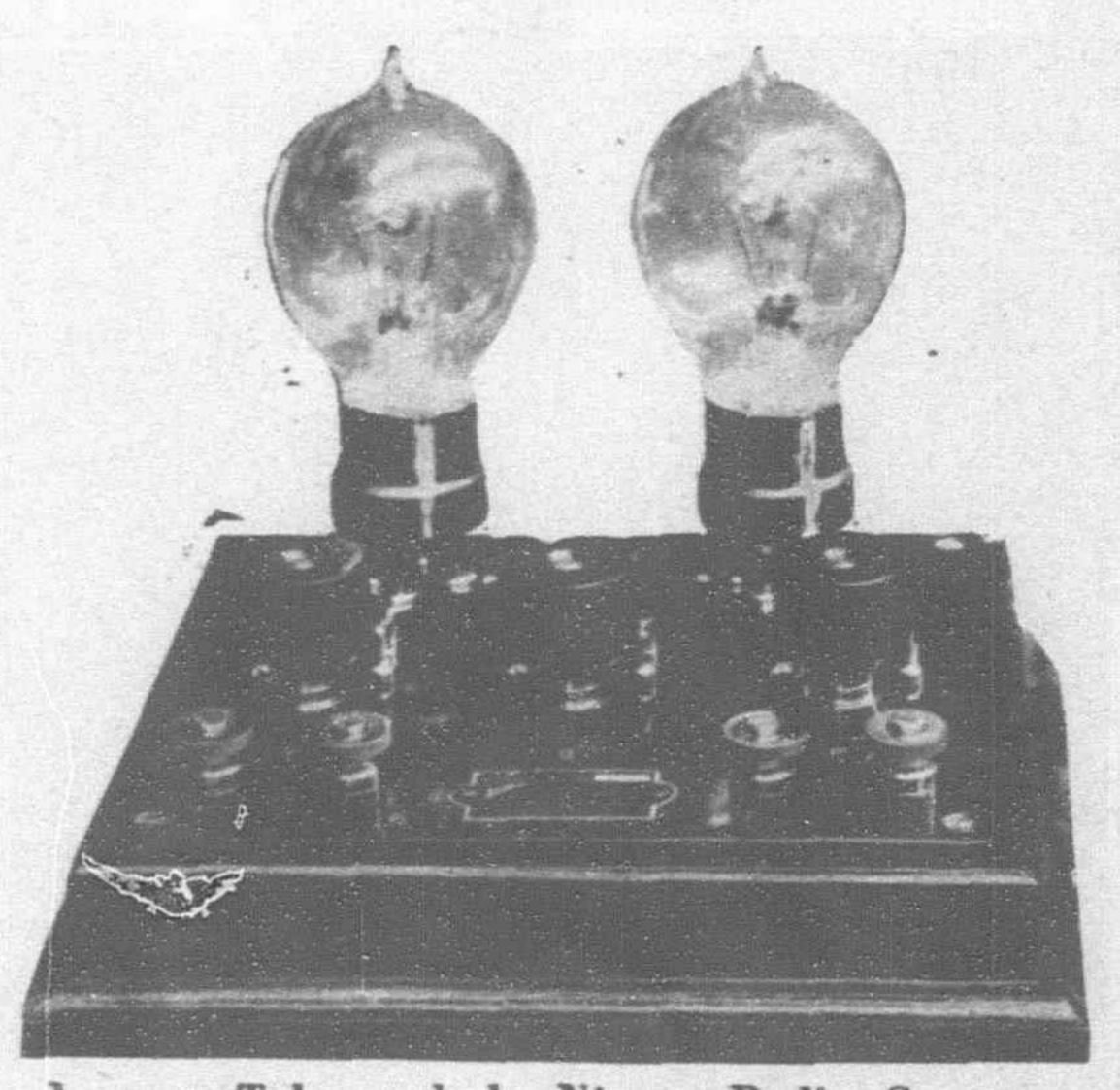
The navy department is carrying on research work at the Tsukiji naval arsenal, in Tokyo. In the early days of navy experiment the ordinary spark system was used. Just before the European war the quenched spark system was adopted, but now the undamped system, the arc system and the generator system are also the object of navy research. The navy operates the Funabashi

station, and has almost completed another station in Taiwan, which is as large as the Funabashi station.

The chief experimenters in the navy department are Dr. Tsutomu Minohara, Mr. Tatsuo Matsuda, Mr. Kazue Hattori, Mr. Katsuuki Nishizaki and Mr. Genyo Osawa.

#### The Army

Up to the time of the European war the Japanese army had done nothing to speak of in developing wireless communication for military purposes. But during the war a section of that department was devoted to wireless experimentation and a laboratory established at Nakano in Tokyo prefecture. To-day the army department owns the Nakano, Moji, Kanazawa and Otaru stations, and



Vacuum Tube made by Nippon Radio Company

there are other military wireless stations belonging to the army department in China and in Siberia.

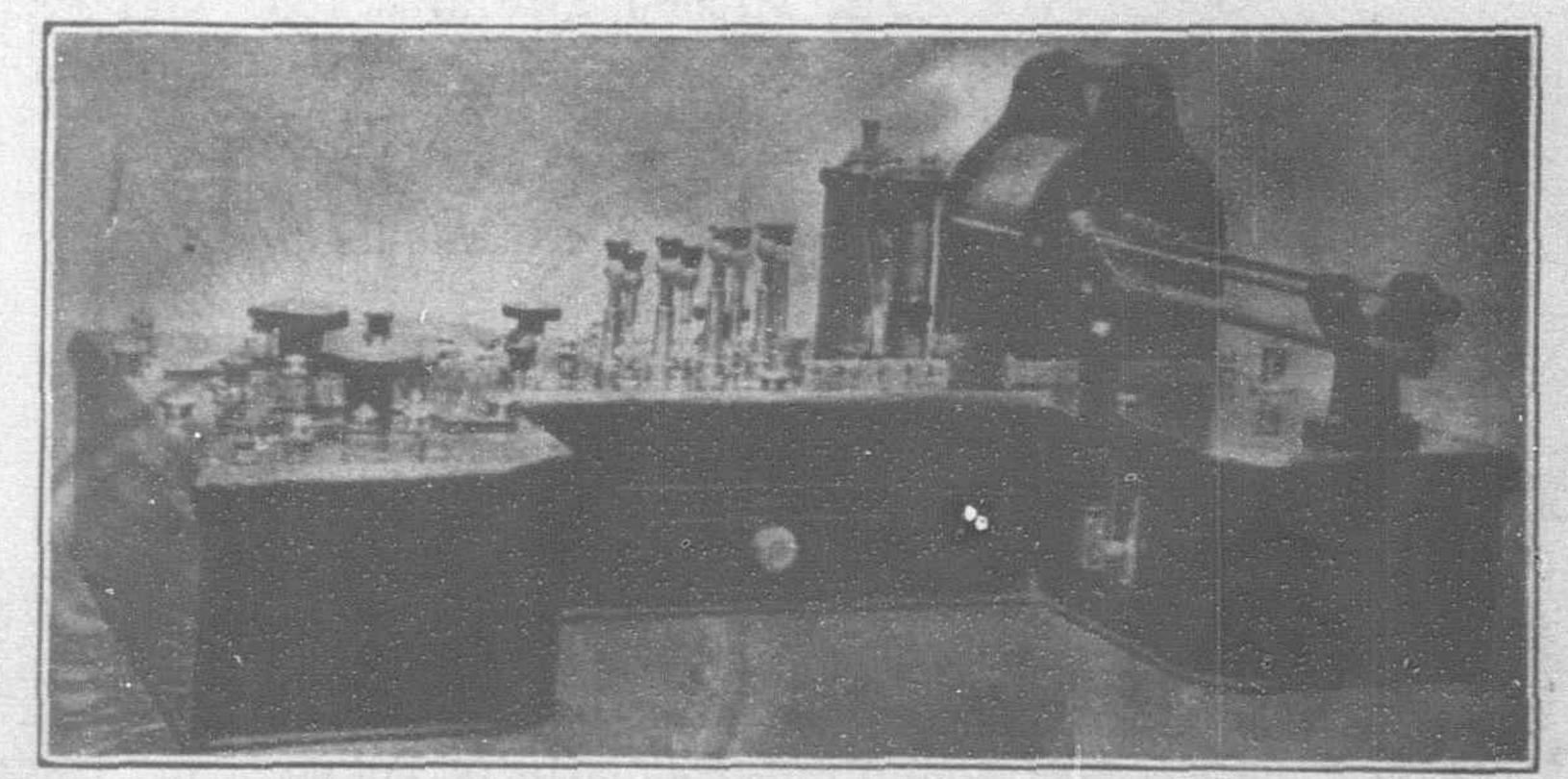
The army is actively purchasing portable wireless apparatus for army use from foreign countries. It is also developing its own system, because the authorities are unwilling to depend on foreign countries for equipment which might be essential in time of war.

The army department also maintains an aerial communication section, occupied primarily with aeroplane study. But under the direction of French officers, teachers in the aviation school, wireless apparatus has been installed on all aeroplanes under their direction. The apparatus is French, but some parts are of Japanese manufacture. Recently some British officers have been engaged as trainers

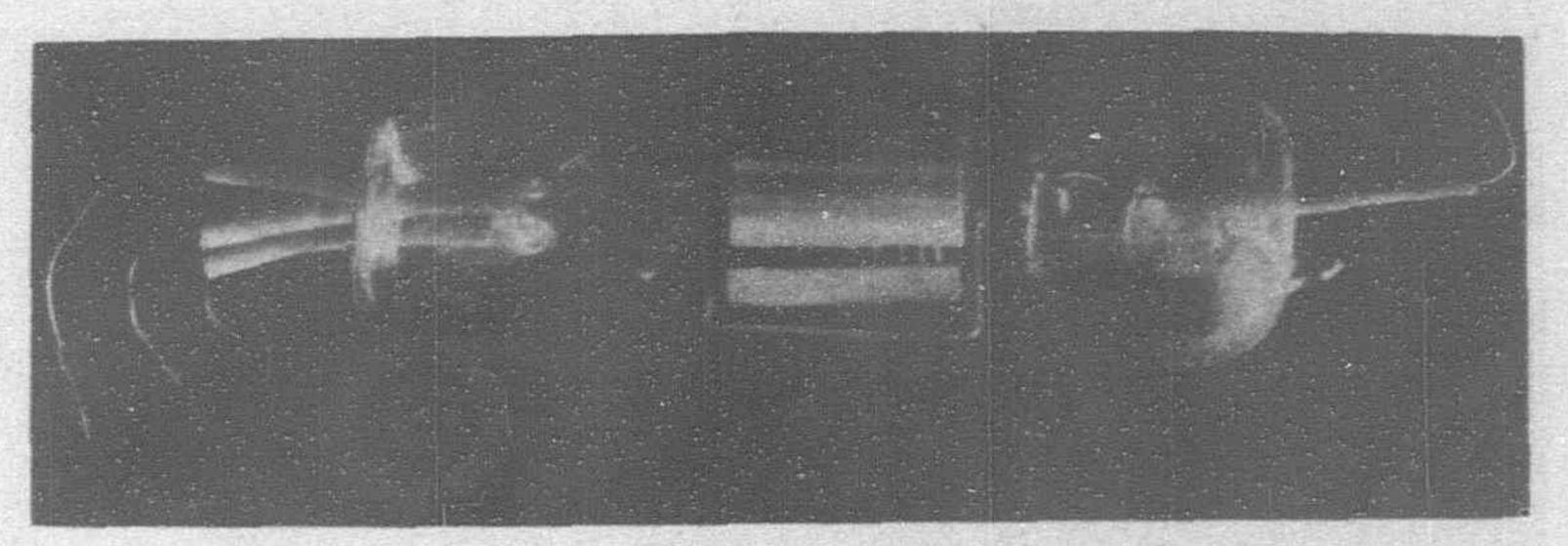
of the aviation corps and introduced British-made machinery. Great expectations are entertained of the development of the aerial bureau, and with the growth of its operations the use of wireless equipment will expend.

#### Department of Communications

With the exception of the stations under the direction of the army and navy, Japan's wireless systems are under the



Receiving Set made by Oki & Company, Tokyo



Vacuum Tube made by Nippon Radio Company

control of two bureaux in the department of communications: the bureau of wireless installations and inspection under the direction of Mitsuru Sahegi, and the bureau of wireless research directed by Uichi Torigata.

The bureau of installations and inspection has under its control the great Haranomachi wireless station which has just recently been built with the object of exchanging direct messages with America. This station is a steel concrete tower 600-ft. high, and will be equipped with its 400-kilowatt high frequency, Alexanderson generator. Pending the installation of this generator the station communicates with Hawaii by the arc system.

This bureau is also directing the construction of the Peking wireless station, contracted for by the Chinese government with the Mitsui Bussan Kaisha.

The bureau of research has been confining its work to experiments on commercial apparatus. The "T.Y.K." wireless telephone apparatus, connecting wireless with ordinary telegraph service, and apparatus which will both send and receive at the same time, have been perfected by this bureau. At present its researches are confined to perfecting wireless telephones.

Only the Haranomachi and the Funabashi stations have been built to handle trans-oceanic communication. Most of the other stations were built to communicate with steamers only.

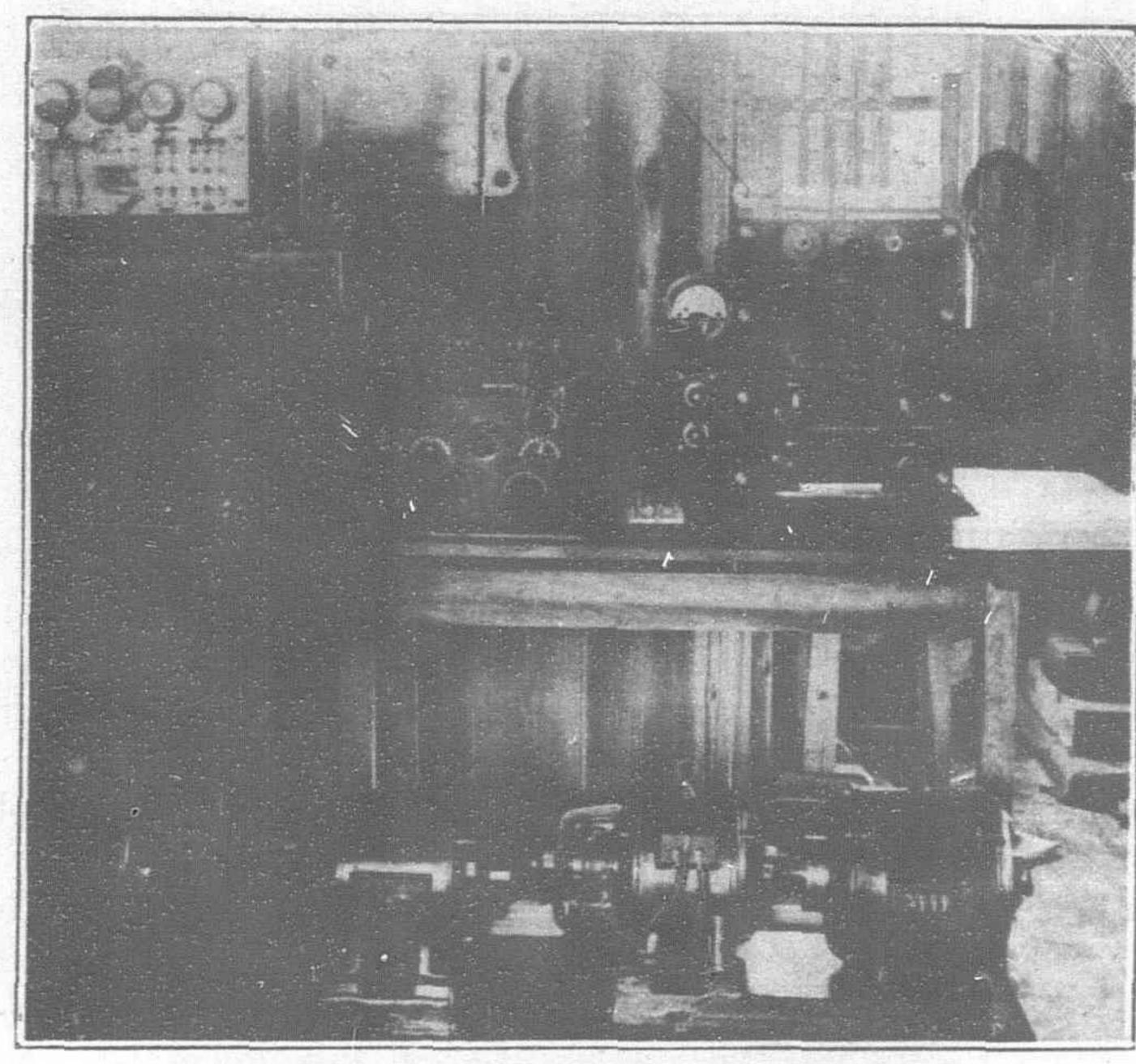
The policy of the Japanese government is to place all steamship wireless plants under the control of government operators. There are now about 310 installations on Japanese steamships, of which, 50 have government operators. With the extension of wireless the demand for equipment is rising, and Japanese companies are slowly monopolizing the business, their equipment being cheaper and almost as satisfactory as that imported from other countries.

The Nihon Musen Denshin Denwa K.K., is the only company in Japan, which exclusively manufactures wireless apparatus. This company has built several land stations for the different government departments and also manufactures all classes of apparatus used on board ship, such as the car system, vacuum system,

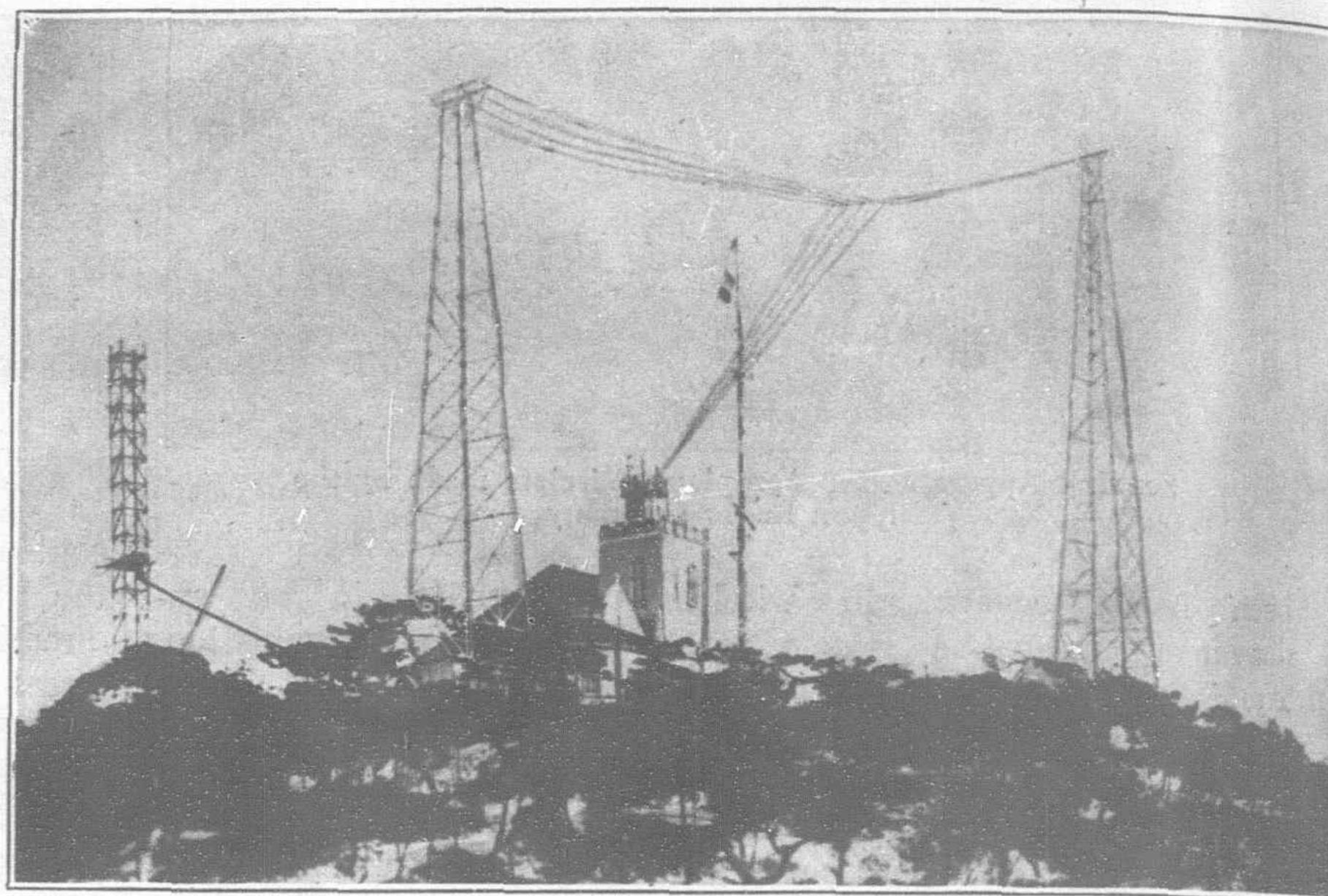
wireless telephones and accessories.

It now erecting and equipping with its own apparatus the Ocean Meteorological Observatory station at Kobe. Two systems will be installed, the are and the spark. When completed, ships will be furnished with meteorological reports. For the first time in Japan, steel towers of the self-supporting type for the aerial lines are being used.

Trawlers, which are so important to the food supply of Japan



Complete Radio Outfit made by the Imperial Radio Company (Teikoku Musen Denshin K. Kaisha)

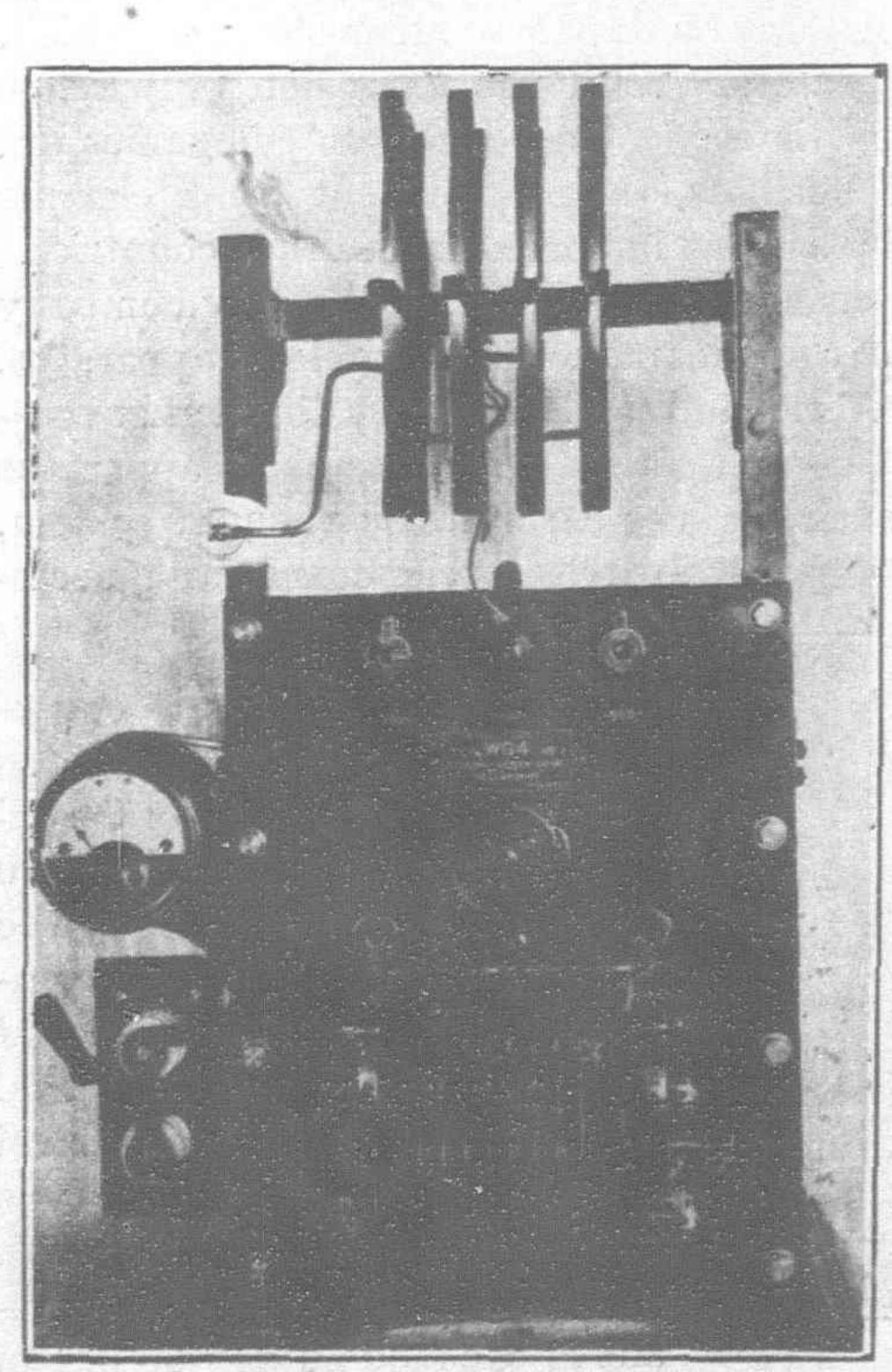


Wireless Station of the Marine Meteorological Observatory, at Kobe, Japan, Erected and Equipped by the Nippon Musen Denshin Denwa Kabushiki Kaisha

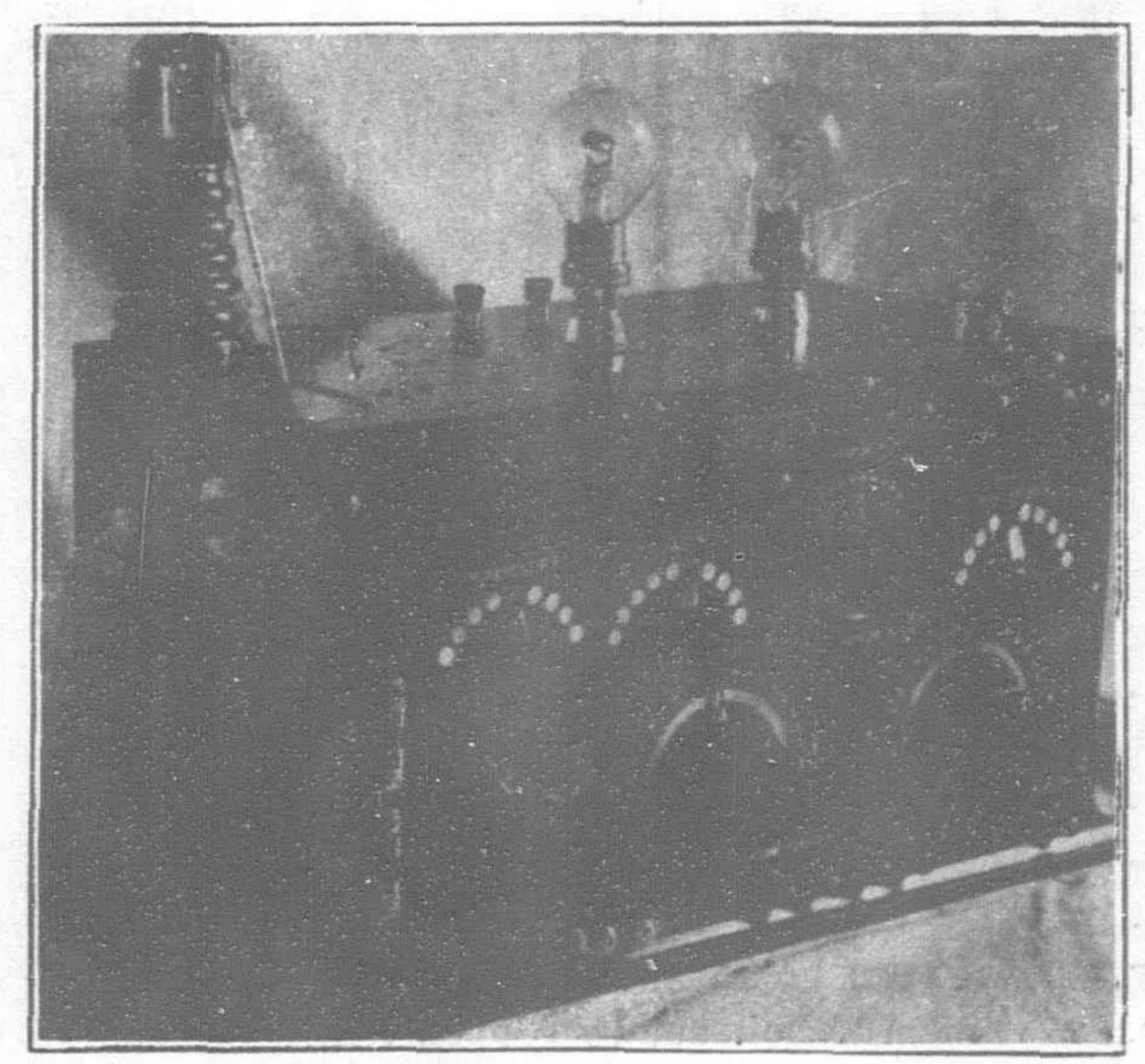
were most irregular in their returns to port, and the market price of fish could never be regulated. The Kyodo Gyogyo K.K., one of the largest fishing companies in Japan, equipped its vessels with wireless apparatus built by the Nihon Musen Benshin Denwa K.K., and as a result has greatly increased its profits by controlling the movements of its vessels.

The capital of the Nihon Musen Denshin Denwa K.K. is Y.1,000,000, one-quarter paid up. Mr. Jukuro Kadono, the principal member of the Business Men's Commission, which has just completed a trip to the United States and Europe, and a director of Okura Co., is president of the company.

In April, 1920, the Teikoku Musen Denki Seisakujo was organized to engage in the manufacture of wireless apparatus. This concern is a subsidiary of



Sending Apparatus made by the Imperial Radio Company



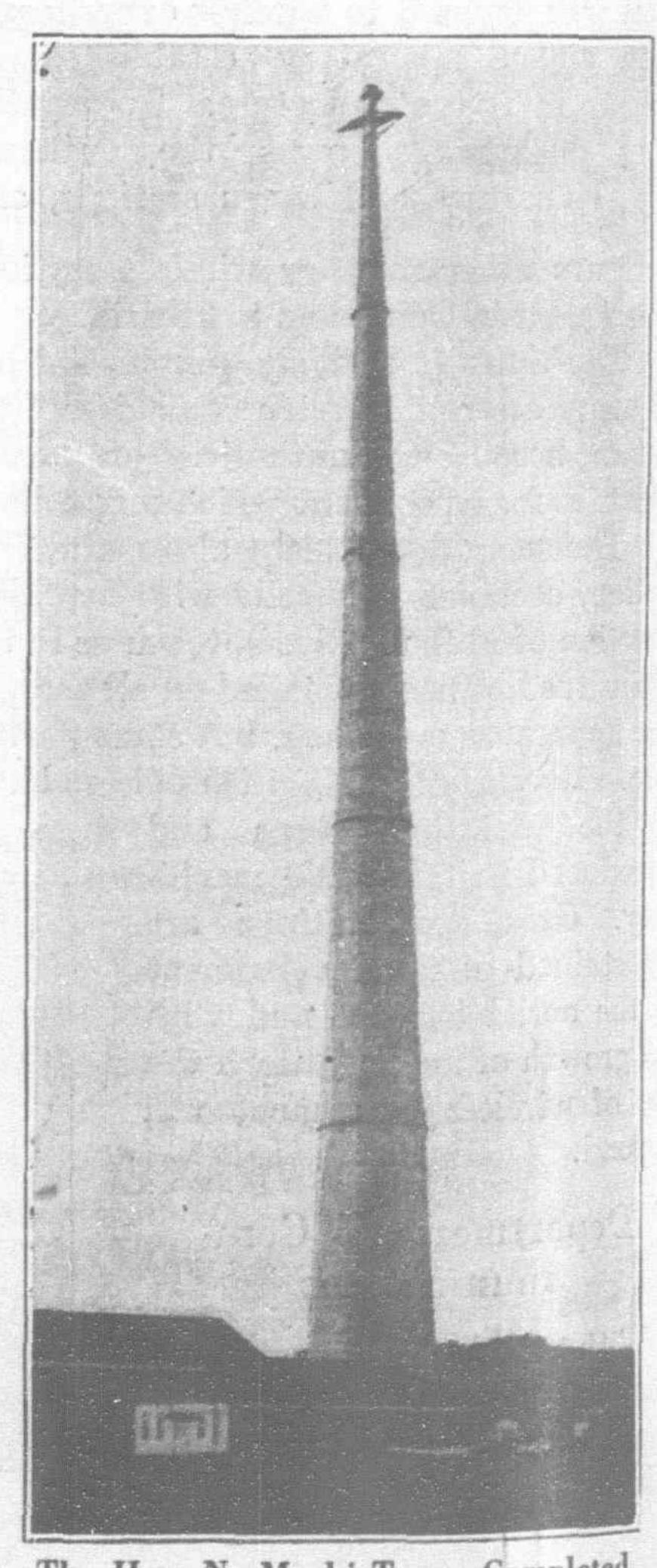
Receiving Set made by the Imperial Radio Company

Suzuki & Co., of Kobe. Its manager is Mr. T. Tsujiminato. Its factory has been erected in the town of Kamata, between Yokohama and Tokyo. Its engineering staff is headed by Mr. Hayao Kadooka, an authority in military wireless apparatus. The works are swamped with orders from the army departments.

The Oki Electric Co., Ltd., established in 1881, is the oldest enterprise in Japan engaged in manufacturing telegraph and telephone apparatus. In 1913, it started the manufacture of wireless apparatus and was at once patronized by the government departments. In 1915, when the private wireless act permitted the private use of wireless, this company installed plants in its head and branch offices, using threekilowatt sets, quenched spark system. In 1918, a vacuum-bulb factory was built by this company, the product equalling in all respects the foreign-made bulbs. In 1919, a workshop to manufacture wireless telegraph and telephone apparatus exclusively for the military departments was constructed on 3,000 tsubo of land in the suburbs of Tokyo. The arc convertor which is to be placed in the Ibaraki wireless station is the product

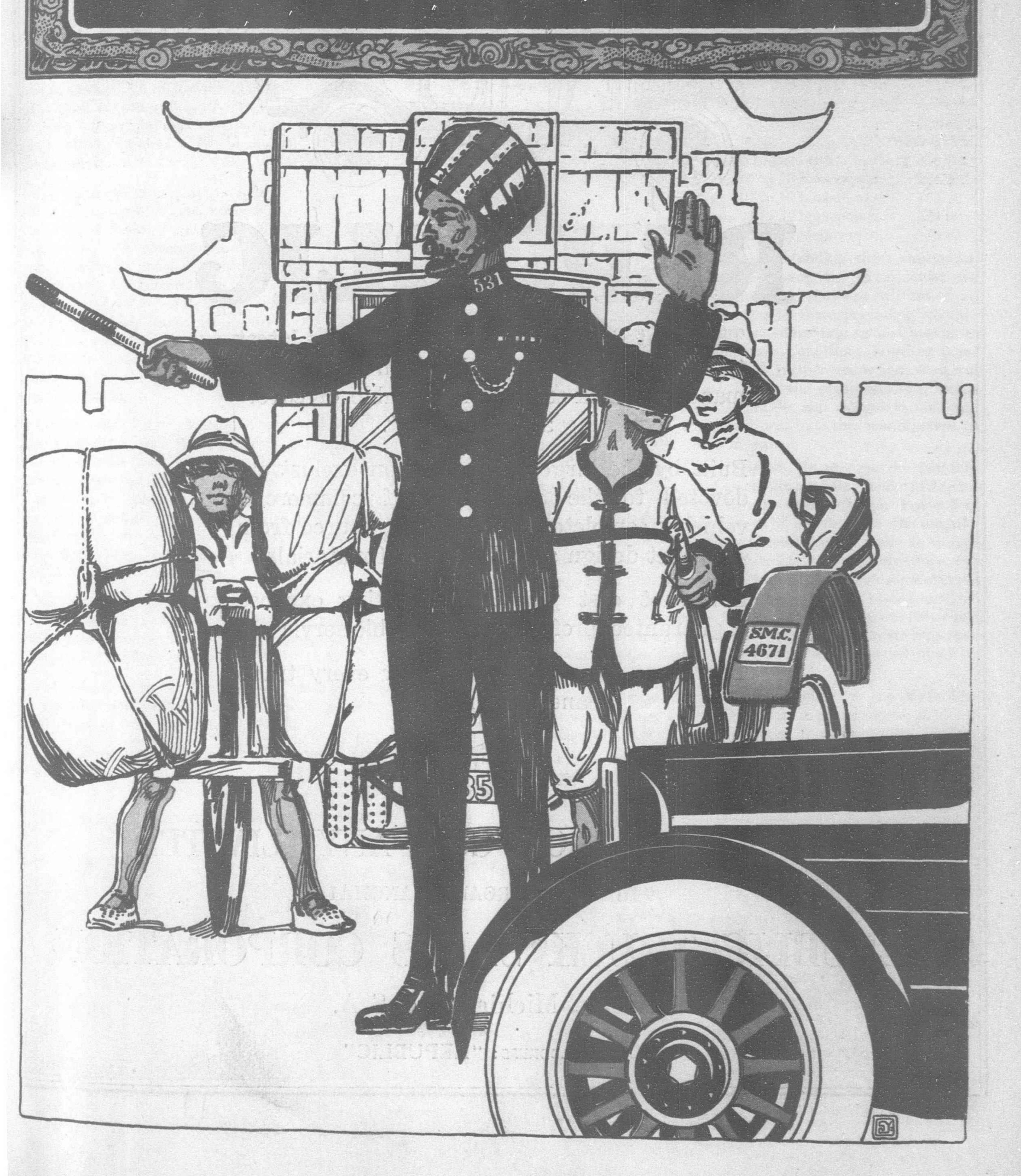
of this company. On December 15, 1921, according to the department of communications, there were 811 wireless stations controlled by Japan. Of these 118 were land and the balance 693 were steamship installations.

	(	On Land	At Sea
Military stations		19	10
Naval stations		20	243
Government, dep	art-		
ment of c	om-		
munications		15	90
Private stations		3	394
Research stations,	etc.	17	
		11 (4	

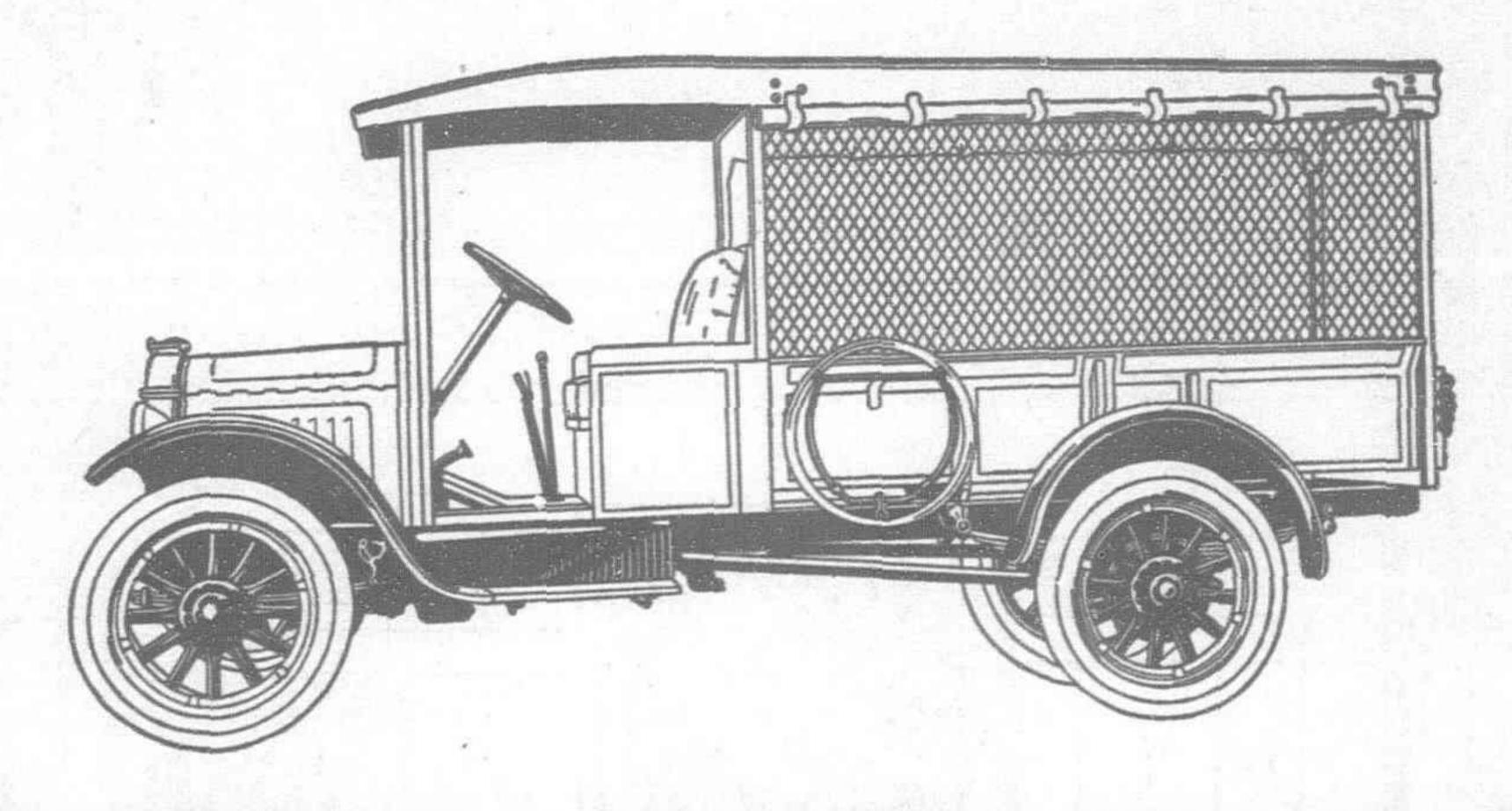


The Hara No Machi Tower Completed

MOTORING-AERONAUTICS-MOTOR BOATING



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CABLE ADDRESS: "REPUBLIC"

## Taxes, Motors and Roads in Japan

APAN is falling into line with the rest of the world in encouraging automotive industries. One of the first steps was to remove the high and discriminatory taxes on motor vehicles which last year were practically prohibitory throughout Japan. In Tokyo, the authorities raised the motor tax by 50 to 80 per cent. The operating costs became excessive and many cars were retired from service. At the time there were 5,000 cars in circulation. Upon promulgation of the law 600 licenses were returned and a like number of cars

placed in storage. A major problem of Japan—that of congestion in cities—was made more difficult of solution because of the decrease in modern transportation.

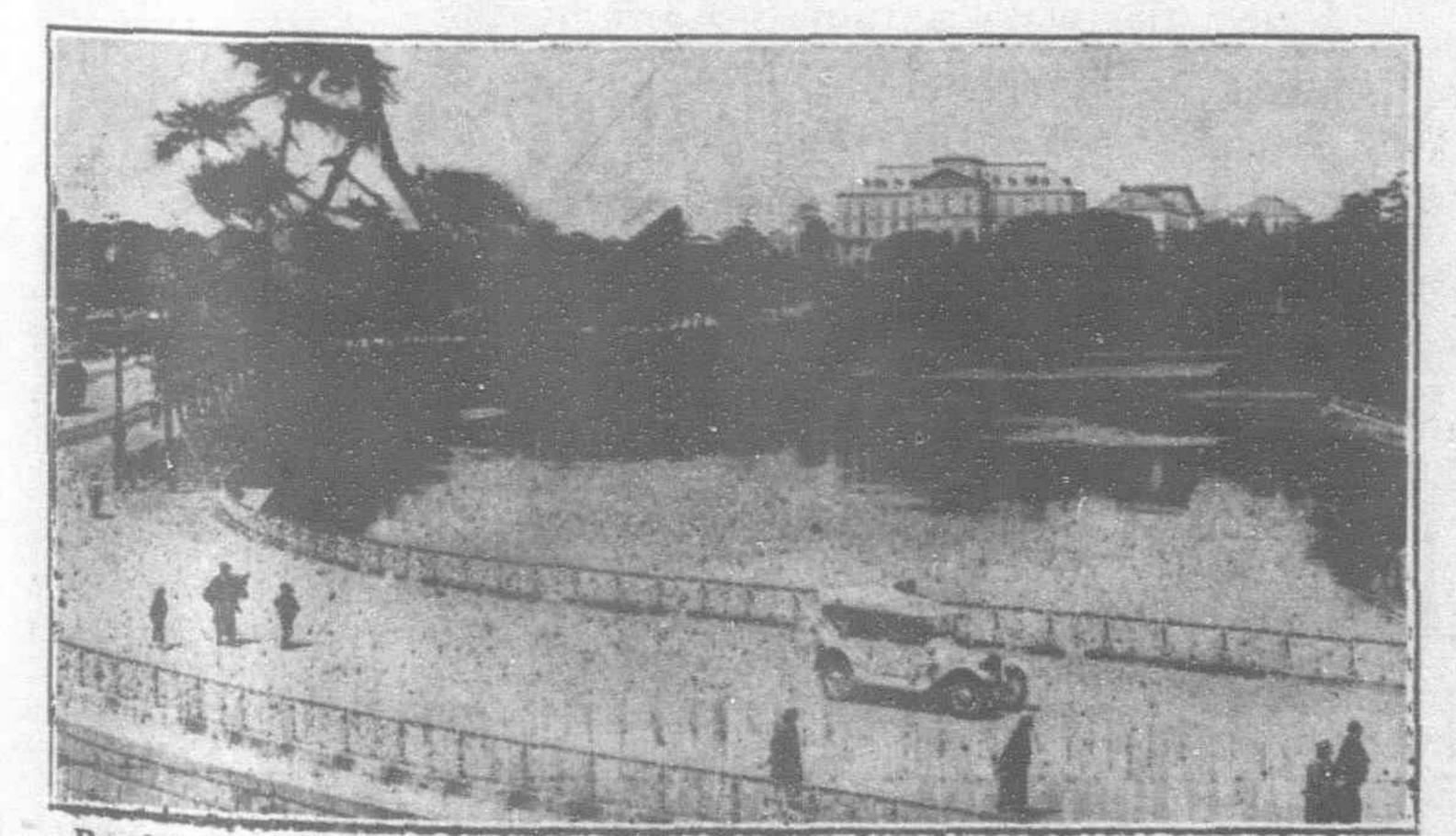
The Japanese government, realizing this error, recently sent an official to the United States to study traffic arrangements. His conclusion was that Japan can solve its problem of congested cities best by encouraging motor vehicle transportation. The removal of discriminatory high taxes is the first step, and the recent action of the Tokyo authorities in that direction may soon be followed by the other prefectures throughout Japan.

In the new Tokyo schedule the biggest reductions have been made in the 20 horsepower class, which includes practically every six cylinder automobile operating in Tokyo. In 1921, the taxes for cars of this class amounted to Y.963.00. The new schedule reduces this by 18 per cent., and the tax now stands at Y. 787.05.

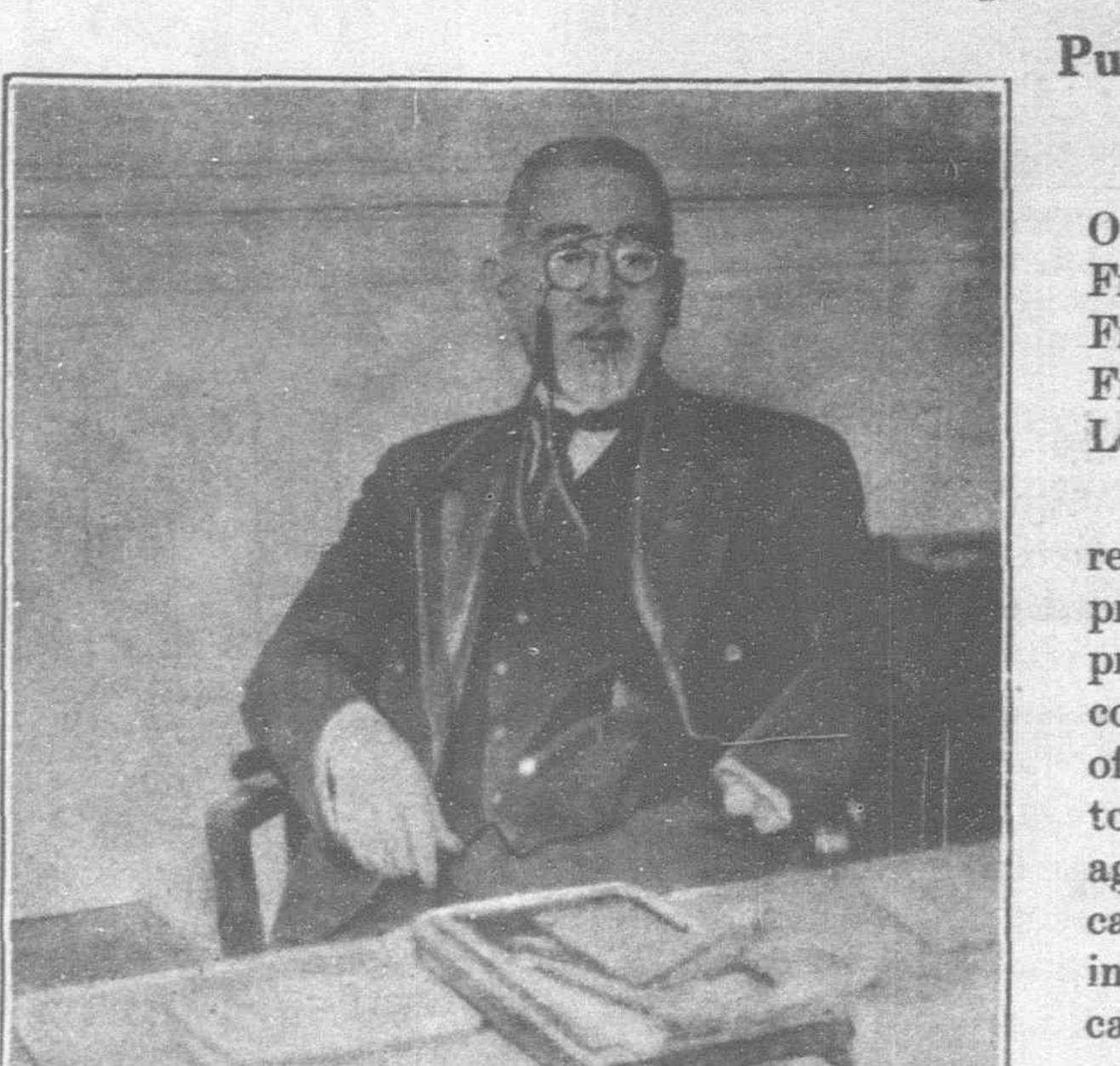
The tax for cars of from 15 to 20 horsepower has been reduced by 10 per cent., in the 10 to 15 horsepower class., 6 per cent., with practically no reduction:in the 5 to 10 horsepower class, embracing the majority of the light cars.

The reductions in the 20 horsepower class and over will benefit both motorists and dealers and increase the sales of six cylinder cars which sell at from Y.5,000 to Y.7,000.

The following tables show the new taxes which went into effect last month:—



Road leading to the Sukurada Cate of the Imperial Palace at Tokyo



Baron Goto, Tokyo's Mayor, who has put through a Yen 40,000,000 Street Improvement Program

#### Private Automobiles and Trucks

			Total Yearly Tax
Over 20 horsepower .			Y.787.95
From 15 to 20 horsepower			614.00
From 10 to 15 horsepower			404.79
From 5 to 10 horsepower			244.90
Less than 5 horsepower .			139.04

#### Public Automobiles and Trucks

Total
Yearly Tax
Over 20 horsepower ... Y.370.80
From 15 to 20 horsepower ... 264.02
From 10 to 15 horsepower ... 185.40
From 5 to 10 horsepower ... 124.00
Less than 5 horsepower ... 75.84

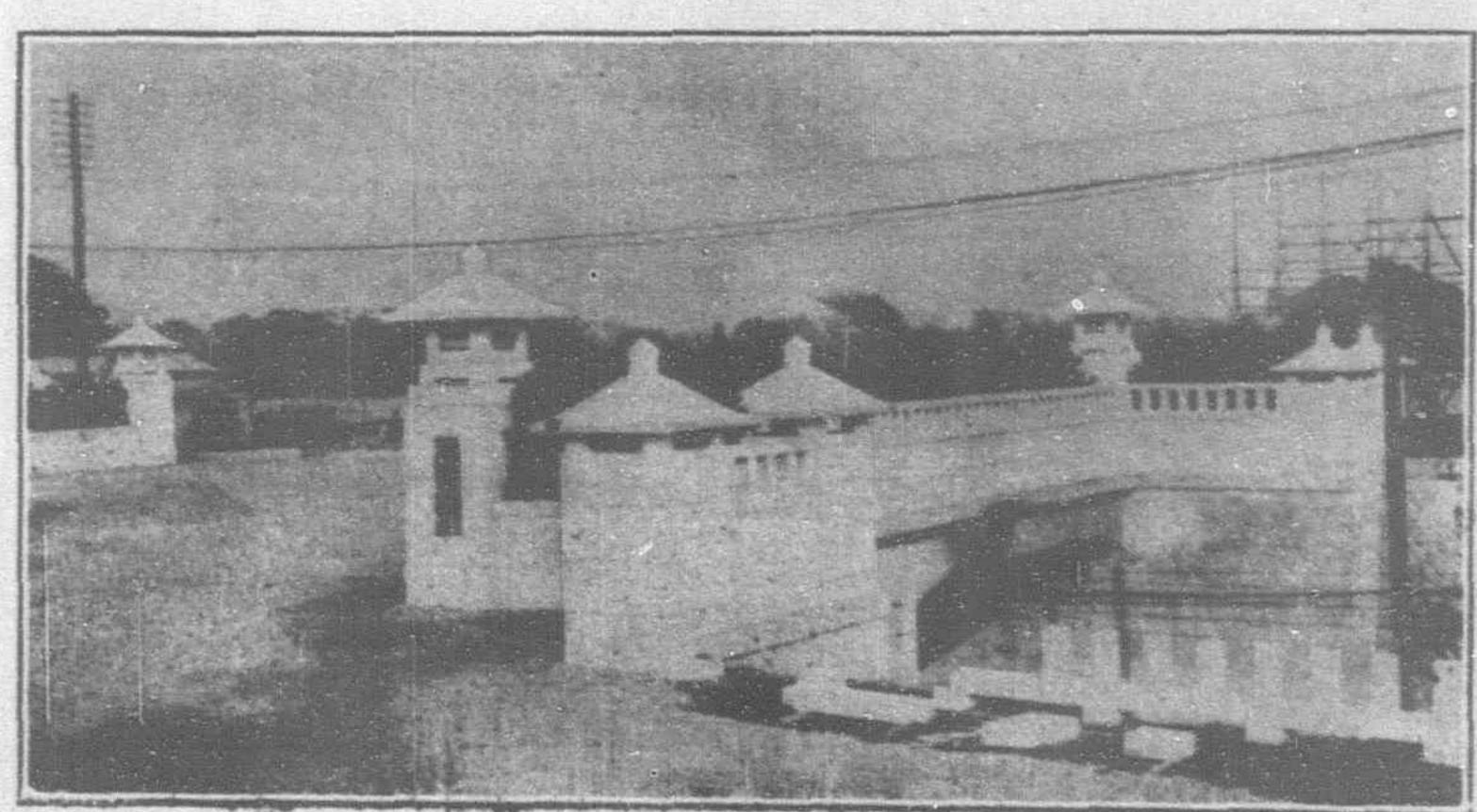
Notwithstanding these substantial reductions over the taxes levied the preceding year, they are still out of all proportion to these prevailing in other countries and militate against purchases of new cars. Conditions, however, point to a still further reduction that will again make the possession of a motor car desirable and stimulate not only importations but the manufacture of cars in Japan.

Considerable progress in building and assembling is being made in Japan, and a visit to the Tokyo Peace Exhibition will demonstrate the remarkable advances already made in design and construction by purely Japanese manufacturers. Although some of these

cars are merely models and have not as yet been placed on the market, they are evidence of the fact that the Japanese are preparing against the day when a national road system will create a market for home automobiles that the government will be called upon to protect on the usual manner.

Foremost amongst the Japanese exhibitors is the Mitsubishi Company which shows a limousine of their manufacture, modeled on the general lines of the 15 horsepower Fiat model..

Another interesting Japanese exhibit is the Gorham three wheel light car, manufactured in Osaka. The touring model



One of the New Bridges over the Sunken Railway Tracks in Japan's Capital



What Makes the Wheels—with Goodyear Tires, notice—Go Round? These Japanese coolies, seeing an automobile for the first time, think the "goddess" on the radiator cap is responsible, the man who took the picture says. Anyway, they're enjoying themselves

seats three, one in front and two behind. It is sold at a low price, about the same as that asked for a large two-cylinder motorcycle.

The Hakuyosha Company exhibits the models of two small four-cylinder cars, which will be placed on the market in a few months.

The German S-B electric, a one-passenger car, which is quite popular in Tokyo is also exhibited as a Japanese machine as it is to be made in Japan.

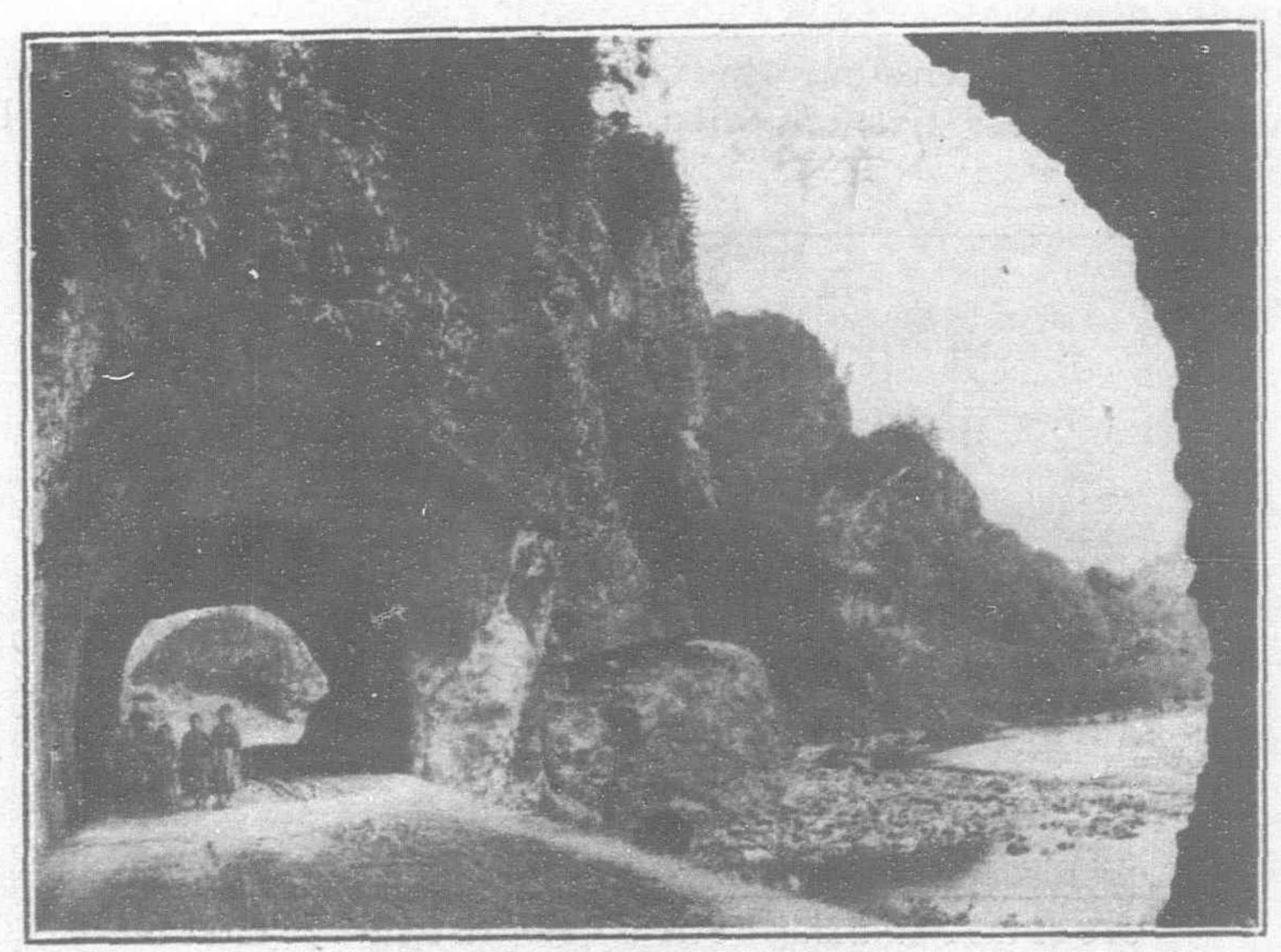
Nosawa & Company exhibit a large Telco limousine electric car, which will also be placed on the market in the near future.

The Tekyo Ishikawajima Company exhibits its Wolsely car which is assembled, mostly from English parts, at its Tokyo plant, under the supervision of English engineers.

If these huge investments in automobile plants in Japan are to bring profitable returns, taxes must be lowered to a point that will not discourage prospective purchasers and roads must be built to facilitate traffic. Tokyo and Osaka are leading the way in street improvements.

#### Tokio Road Program

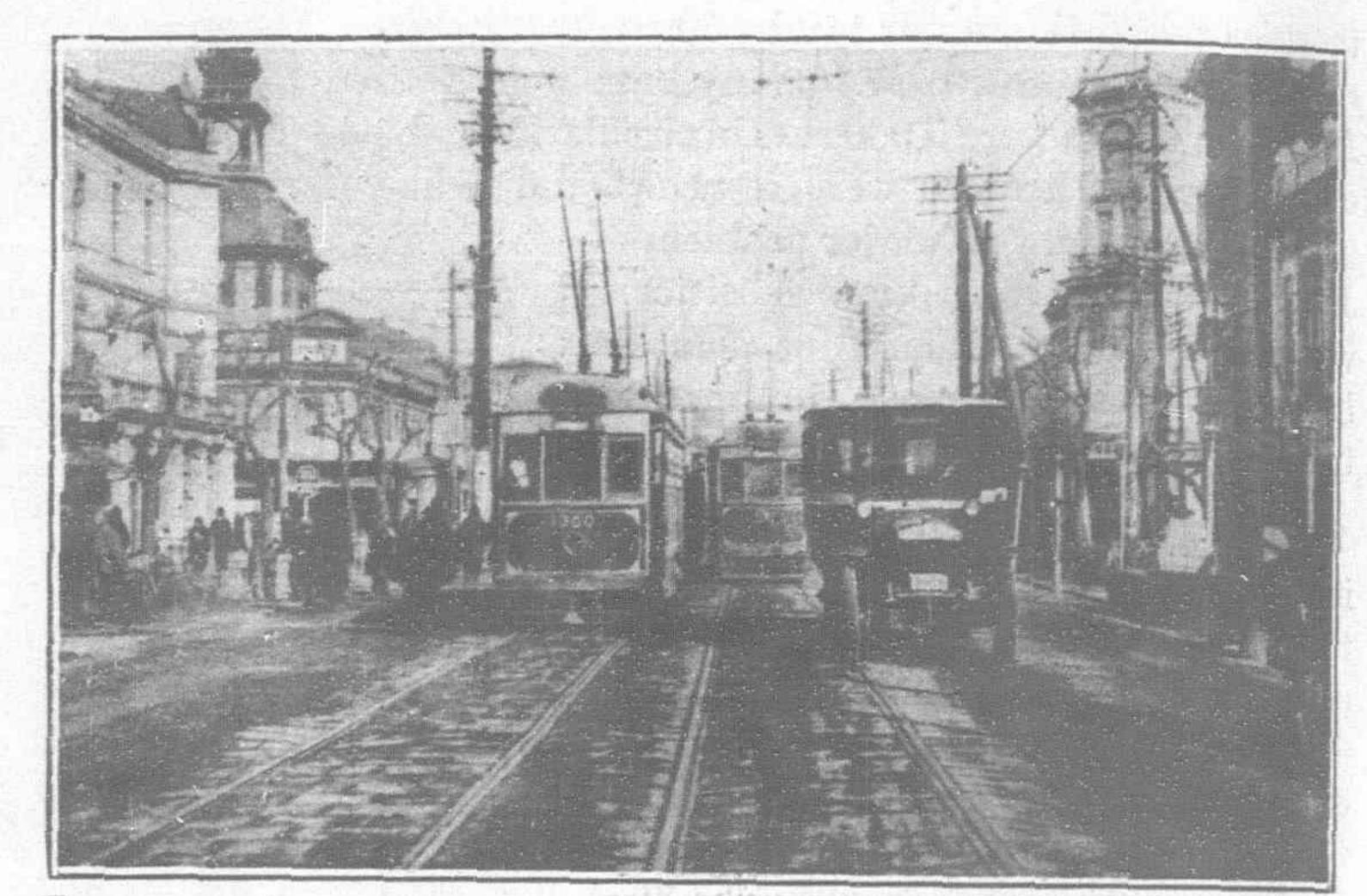
Before fixing upon a definite program, the municipal authorities of Tokyo have been making careful studies of road materials and from 1910 until 1920, 72 paving experiments were carried out enabling the city to determine just what kind of pavement is best suited for Tokyo.



The Yabakei Road in Kyushu

As a result of these experiments a huge program extending over a period of four years has been drawn up and approved by the Municipal authorities.

This provides Y.39,468.000 for new pavements to be completed by 1926 and approximate 275 miles of modern roadway. The streets which are to be paved will be the main thoroughfares, the Ginza being a good example of this work. Stone, wood-blocks and asphalt are to be the principal types new street work. The funds are now available and the home office has signified its willingness to grant five-twelfths of the desired money.



Trams and Motor Buses on the Ginza, Tokyo's Main Artery of Traffic

#### Asphalt and Road-Making Machinery

Considerable asphalt has been used as surface dressing for Tokyo's macadam and wood-block pavements, and recently an order for 2,000 tons of Trinidad asphalt was placed with the Barber Asphalt Company of Philadelphia, whose representative is now making a tour of Asia investigating the possibilities for asphalt pavements.

As a result of the activity in road building not only in Tokyo but in Osaka and other parts of Japan, considerable business has been done in road-making machinery and dump carts, with the prospect of further large orders in the near future. Here at least is one place in the Far East where modern road-making machinery can find a market, as the extent and character of the program and the limited length of time involved in carrying it out, calls for the employment of up-to-date methods.

#### Osaka Roads

The city of Osaka will also soon begin an extensive road building program which will extend over a period of ten years and more than 40 million yen will be spent if the plans as proposed by the Osaka city planning commission are accepted and passed by the home department of the national government.

Under the plans as put forward by the city authorities ten main highways radiating from Osaka will be thoroughly made over. The new highways will be of macadam. This investigation has been going on for the last several months with Mayor Ikegami taking a leading part. He is chairman of the city commission. The plans also state that the new roads will be from 48 to 72-ft. in width, this depending upon the amount of traffic which will have to be accommodated. This program is primarily intended to improve the roads in the outlying districts of the city.

According to their announcement the city is also planning to enter upon another program of approximately the same size in rebuilding the city streets of Osaka. This is dependent upon whether or not the first program is accepted by the government. It is planned to carry out the second program in conjunction with the building of the proposed new railway station for Osaka, which is to be the largest in Japan.

#### Autos and Trucks in Japan

In 1920, 95 per cent. of the number and 93 per cent. of the value of motor vehicles imported into Japan were of American manufacture. Imports from the United States in 1921 declined to 77 per cent. of the total number and 66 per cent. of the value. The following table shows the number and value of automobiles imported, by countries of origin, in 1921:—

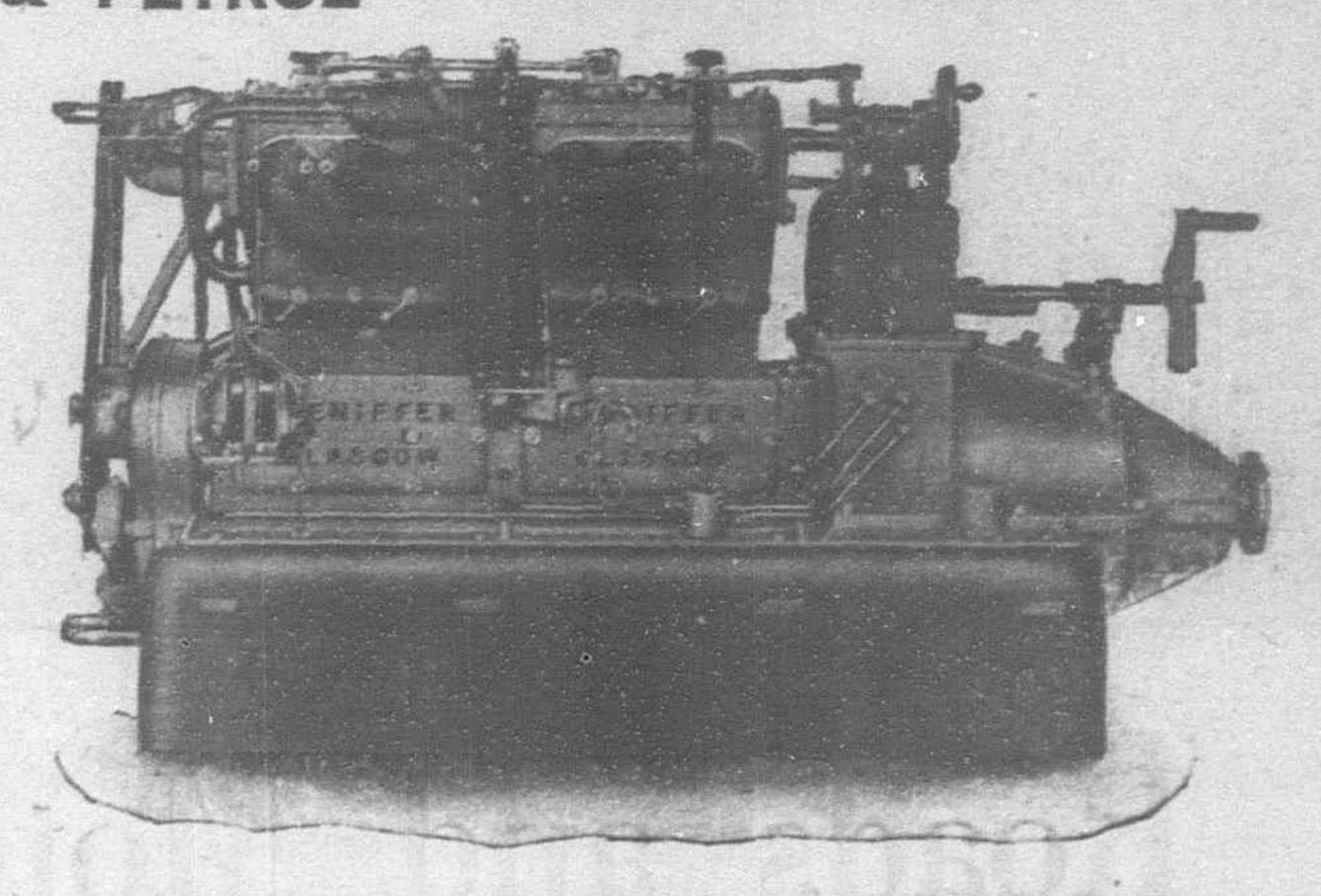
Imports of Motor Vehicles into Japan in 1921.

Cou	ntrie	s of Orig	in.	Number	. Value.
United Sta	ites -			832	\$2,160,638
England				75	476,480
France				83	353,432
Italy				46	160,645
Germany				22	32,009
Belgium				4	41,042
Kwantung	Prov	rince		5	16,006
Canada	• •			6	31,112
		Total		1,073	3,271,364

The decline in imports from the United States was especially noticeable in the latter part of 1921, while those from France increased appreciably.

An unofficial investigation as of June, 1921, reported 12,440 cars and trucks in Japan, the number of passenger automobiles being estimated at about 12,000. Approximately 2,550 passenger cars are operated in and around Kobe. There are about 450 trucks in the country, 200 of which are located in the vicinity of Kobe.

# GLENIFFER KEROSENE MARINE MOTORS



#### FOR ALL TYPES OF BOATS

RANGE OF MODELS-10 TO 90 H.P.

AGENTS:—Douglas and Grant Ltd.—at Madras, Rangoon, Bangkok, Saigon, and Haiphong.

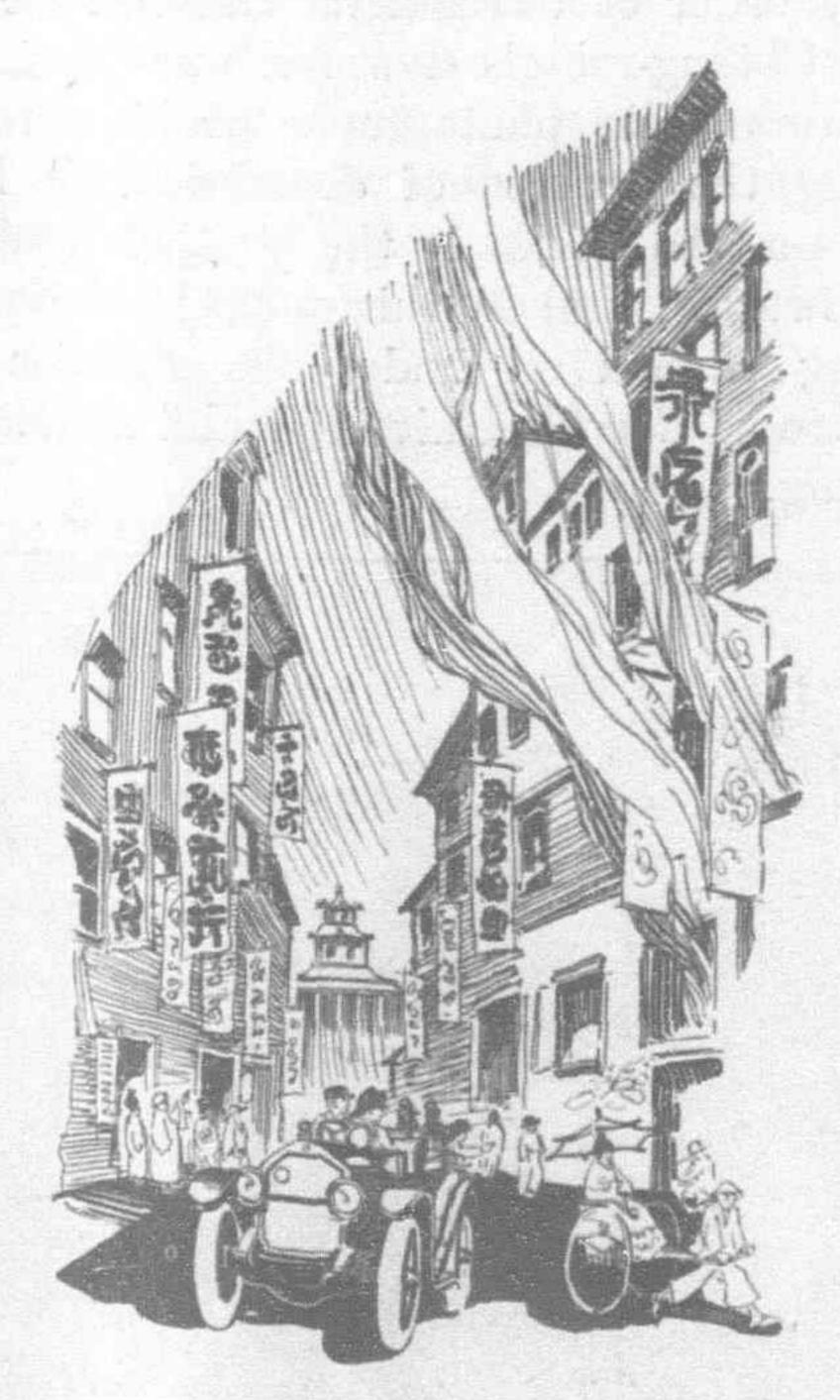
Ritchie and Bisset—at Singapore.

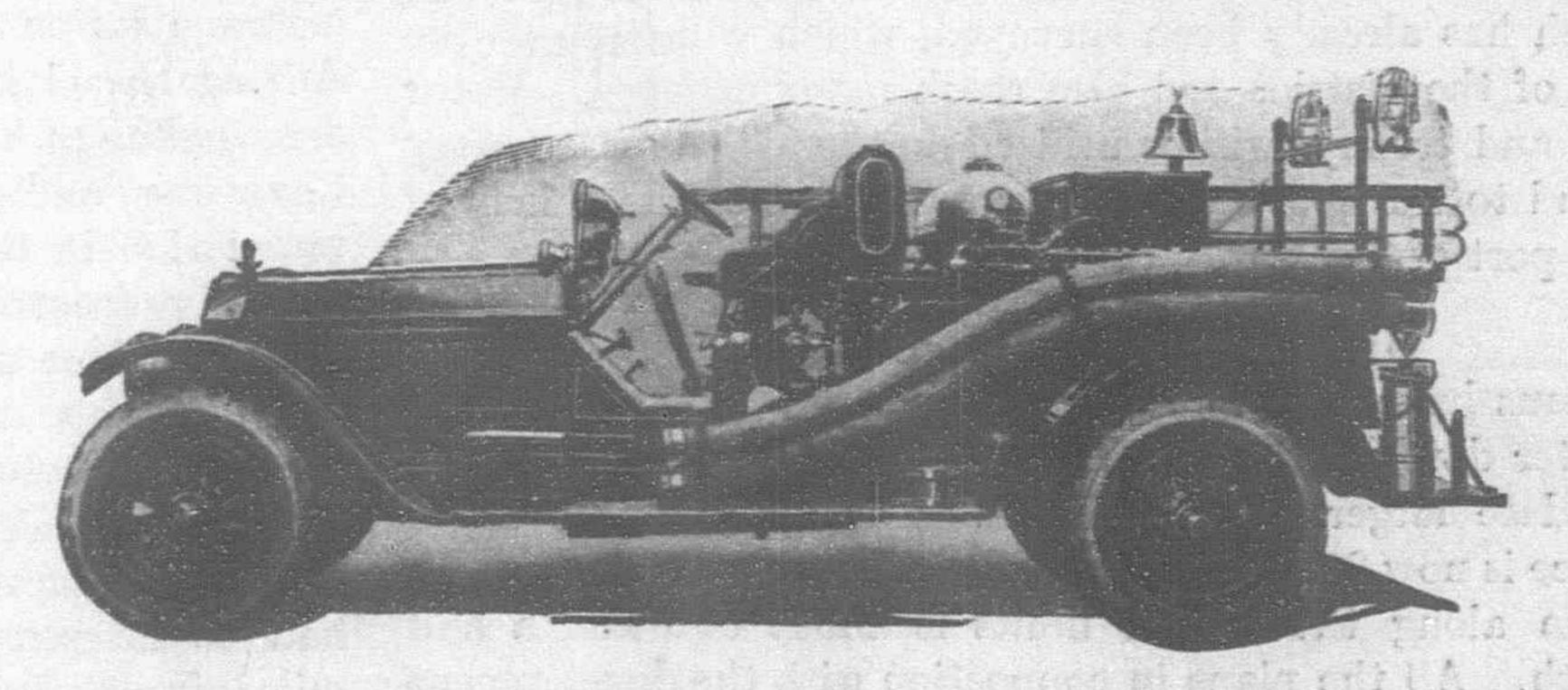
British and Dutch Engineering Co., Ltd.—at Batavia and Soerabaia.

#### GLENIFFER MOTORS LTD.

ANNIESLAND, GLASGOW, SCOTLAND.
TELEGRAMS: "GLENGINE, GLASGOW."







### GET TO THE FIRE—QUICKLY.

No matter whether its a pull over rough city streets or a stiff uphill grind over country roads, American La France Fire Engines are noted in all parts of the world for "being first at the fire."

Every part is built to stand the strain and the motor is powerful. Equipment includes 40 gallon chemical tank, pump, hose body, suction hose, two ladders, axe, crowbar, pike pole, lanterns and two hand extinguishers.

We are also makers of commercial motor trucks, and other types of fire apparatus.

Write to-day for further particulars to one of the following:—

Okura & Co., Tokyo, Japan.
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Milton E. Springer Co., Manila, P.I.

Mustard & Co., Shanghai, China.

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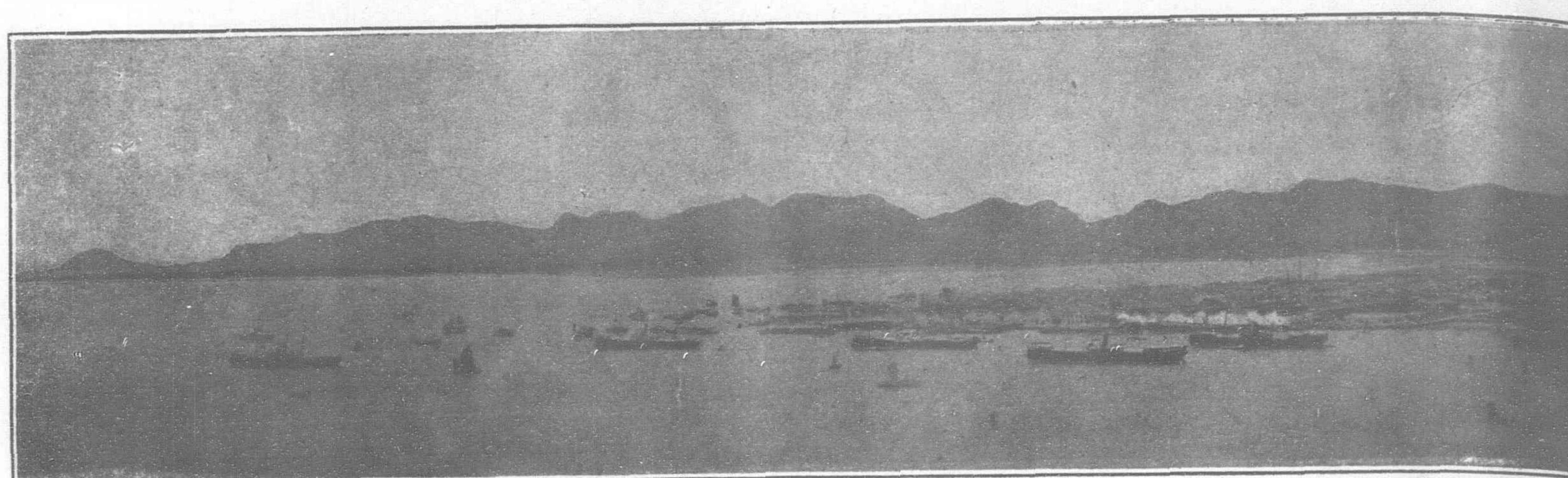
Dodge & Seymour (India) Co., Ltd., Calcutta, India.

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PANORAMIC VIEW OF SWATOW

## Roads and Motors in South China

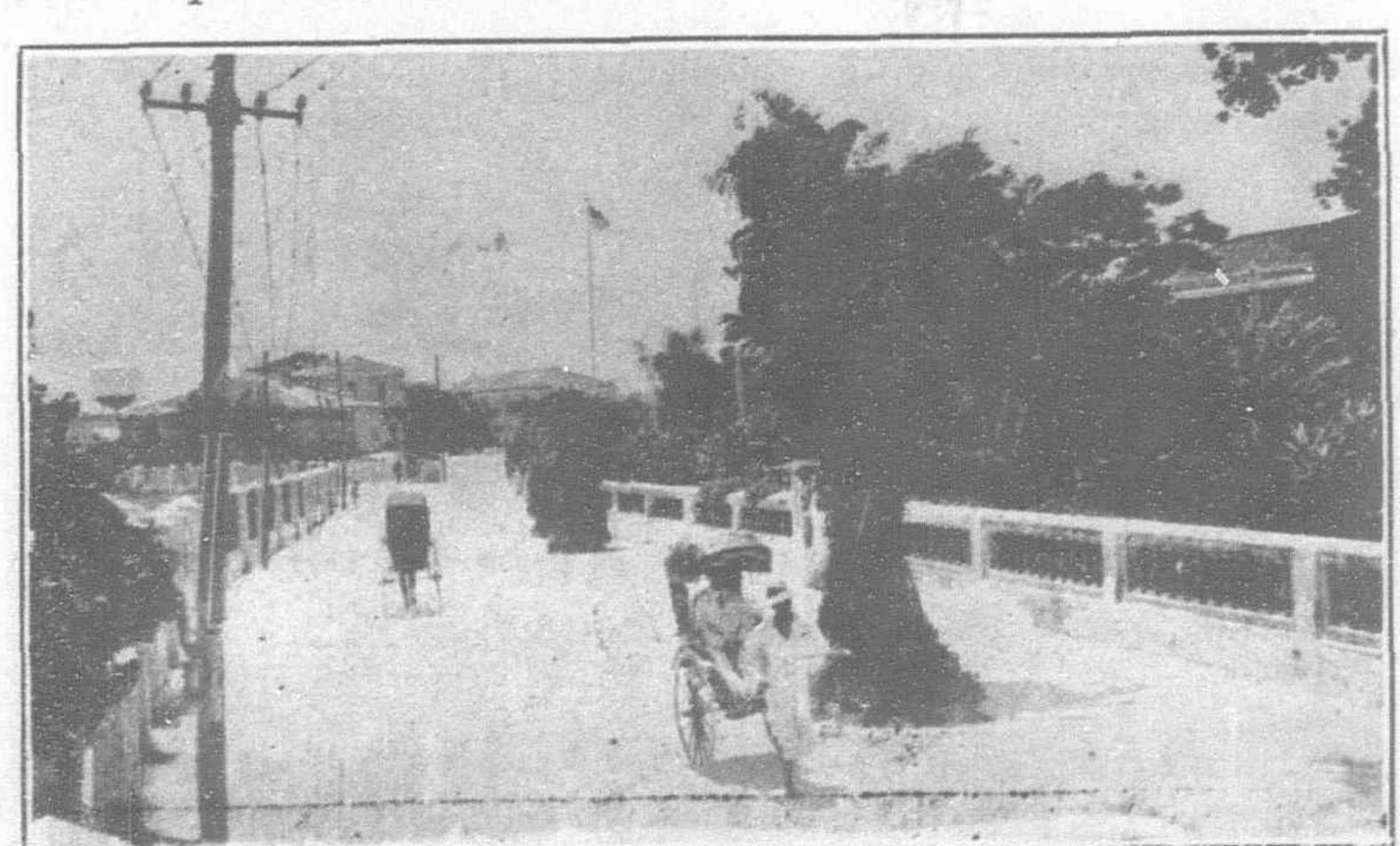
200 Miles of Macadam Roads to be Built

#### The Swatow District

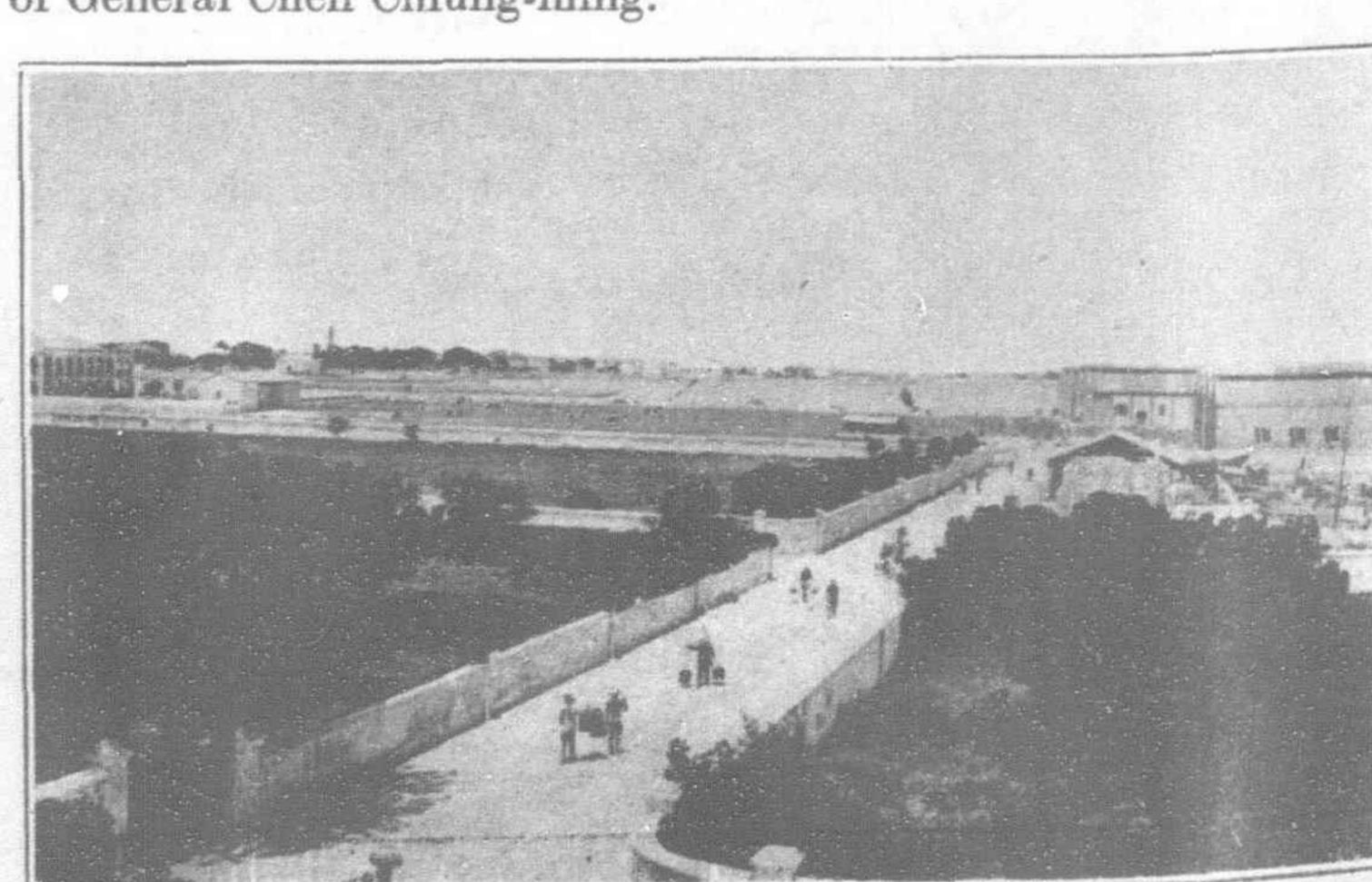
HE often extolled progressiveness of Canton is not confined to that city alone in Kuangtung, and due attention should be given to the highway construction planned and, in fact, begun in the Swatow consular district, which comprises the eastern portion of Kuangtung and includes approximately 17,000 square miles of territory. Up to the present the total length of highway in the district capable of accommodating four-wheeled vehicles has been less than two miles and this stretch is found within the limits of the city of Swatow itself, says a correspondent in The North-China Daily News. Now over 200 miles of macadamized highway is projected, some of which has already been surveyed, which will connect the largest cities of the district and also reach many villages. Motor buses, lorries and trolleys will be utilized on the highways, to carry passengers and to transport export cargo, which consists chiefly of sugar, to the port of Swatow.

Harbor Development

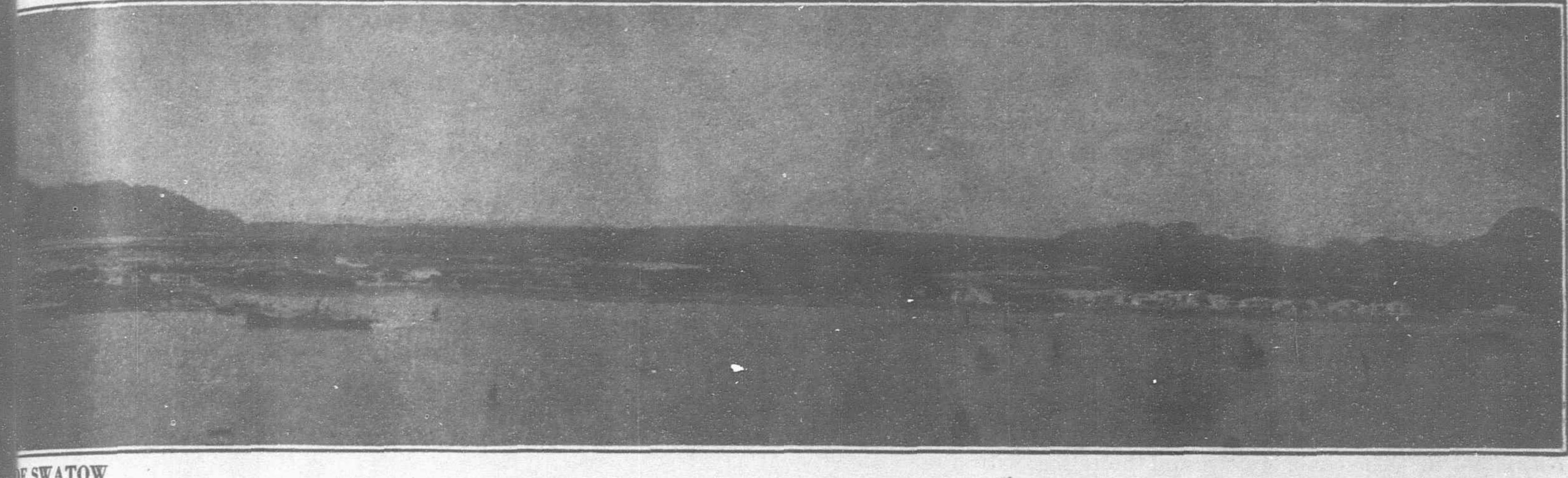
Other plans have been made for harbor development to take place at a later date, when the entrance channel will be deepened to accommodate larger draft steamers. The approximate depth the fact that General Chen Chiung-ming's downfall was predicted at the entrance is now 20 feet at high tide and seven at the lowest. when his ancestral tablet and the photographs of his parents The coast-line along the harbor limits is about two and a half had to be removed during the process of demolition. A few miles in length. All the plans in connection with the development miles from Haifeng and on the coast is the port of Swaboi, are being worked out by the department of highway engineering, second in importance to Swatow, and in this port, development organized at the instigation of progressive officials and business and improvement is being carried on under the direction of men of the province, whose object is to make Swatow into the great Mr. K. Y. Chen, a graduate of Cornell University and a relative southern port for China.



Included in the comprehensive scheme of highways is one which will link Canton with Swatow. The main road to be built is one which will run from Chaochowfu to Kuetan, via Kityang, a distance of about 72 miles. This highway will connect with another which is being constructed between Kuetam and Waichow, whence a road is already built into Canton. The final link in the chain is the road, soon to be surveyed, between Swatow and Chaochowfu, a distance of about 24 miles. There is already in existence a railway line between the last-named two cities, which is the only railway in the whole of the Swatow consular district. It is considered that highways are more feasible than railways for the development of communication, because they will reach a greater area of country. Among the cities reached under the present scheme of highways are Ungkung; Yaop'ing, northwestward from Chaochowfu; Puning, Chaoyang and Huilai, all of these being the largest centres of population in the district and important avenues of trade. The highway from Chaochowfu to Kuetam passes through Haifeng, the birthplace and old home of General Chen Chiung-ming. The walls of this city have been completely torn down and wide streets are being made by order of the general and in spite of of General Chen Chiung-ming.



New Roads in the Swatow Settlement



#### The Scheme of Roads

The roads as planned, which are under the direction of Mr. 1 H. Kuan, are to be 30 feet in width, graded according to the most improved methods, and surfaced with macadam. All the bridges are to be of reinforced concrete and not less than 30 feet wide.

The country traversed by the road between Chaochowfu and Canton is said to be very beautiful, for the most part level, cut into small fields of rice and other crops, but with small hills at frequent intervals and one range, at least, of mountains, which will have to be crossed or tunnelled. The mountains are rocky and will afford the granite and rock necessary for the construction of the highway. This one road is estimated to cost about one million dollars. The cost of surveying is being paid for out of a tax on joss paper and one or two other luxuries and the returns are said to be more than enough for the purpose. The major portion of the expense of construction will be borne by the cities and villages through which the highway will run. The macadam surface, which is the most expensive portion of the construction, will not be applied by the highway engineering department but by an operating company which, in return for surfacing the highway, will be granted a monopoly to run motorbuses for a period of 20 years over the roads, after which the expense of keeping them up will revert to the government.

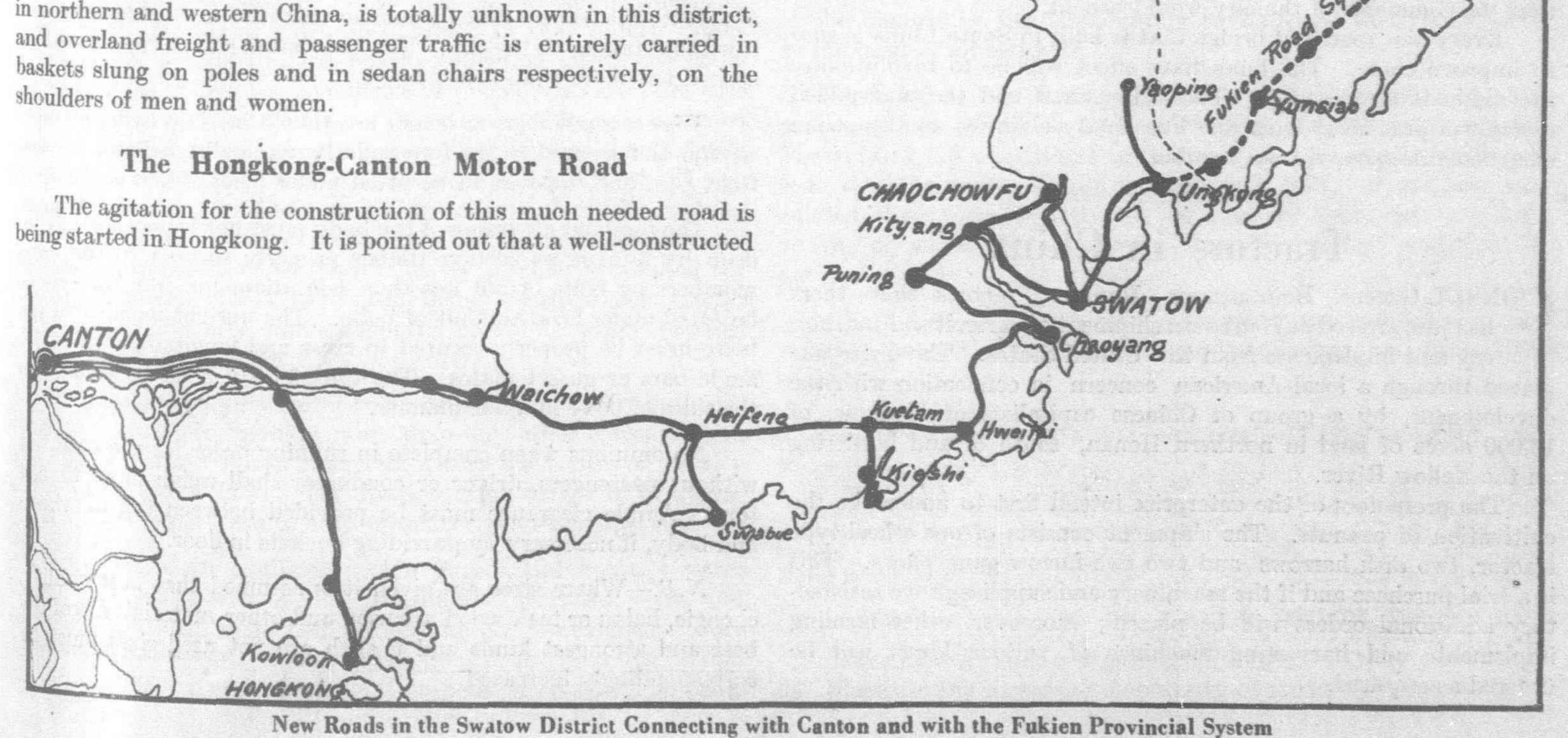
The possibilities of this development as planned will be seen to be very great when it is considered that all communication heretofore has been the limited one afforded between cities and villages by boat over rivers and canals and, where these have failed, over three-foot pathways constructed of pounded sand and lime, which are satisfactory for foot traffic. The wheel-barrow, so ubiquitous in northern and western China, is totally unknown in this district, and overland freight and passenger traffic is entirely carried in baskets slung on poles and in sedan chairs respectively, on the shoulders of men and women.

motor road connecting Hongkong and Canton would soon become an asset of world-wide importance for all this section. Its fame would spread to every corner of the globe. It would mark these two cities as enterprising and progressive communities. In dollars and cents the income direct and indirect would soon far surpass the outlay.

It is suggested that meetings be called in both cities and a Canton-Hongkong highway association formed with offices in both cities. It is urged that prominent men in both cities be found who will co-operate with a live executive with at least one Chinese and one European to lead in the matter. Difficulties and problems connected with the matter can all be met and disposed of if a group will set themselves unwaveringly to their task.

In a leading article supporting the project, the Canton Times says: Besides being a connecting link between the two cities, such a road would also open up a rich, fertile, agricultural section, and by means of motor communication, make it possible for the farmers to bring their produce to Canton where they can obtain better prices than in the market towns in the interior. This would enrich the farmers and give both Hongkong and Canton new sources of food supplies.

Short roads intersecting this motor road could be constructed by the villagers and a motor truck service should bring their produce to the nearest railway station on the Canton-Kowloon Railway. The freight service of that road would soon have to be increased.



The facilities offered by this motor road could be utilized whenever the authorities have to deal with robbers in that section of the country. Better communication is one of the factors in the solution of the bandit problem in this province. If the road is well policed and an efficient telephone system installed along its whole length, soldiers could be moved to points wherever their services are needed.

Cars, Cabs and Boats in Hongkong

A few months ago, some Chinese in an outlying fishing village started a service of motor-omnibuses into the city of Victoria. Now the latest advance is the small taxicab. The type is probably well known to readers of this journal; it is a sort of an enclosed sidecar and motor-bicycle outfit.

In a few months 100 British-built taxicabs will be plying for hire in this colony, says the correspondent of the *Times Trade Supplement*. The chair is slow, and the ricsha, with a man puller, is more popular where the roads admit of that vehicle. Where a ricsha can go it is probable that the new taxicabs will go. The really interesting thing to watch will be the practical results. Will petrol prove cheaper than human muscle? It will certainly be much more popular.

The man pulling a ricsha receives about ten cents, Hongkong currency, a mile. That is, with a normal exchange, just about 2½d. He carries only one passenger. The new taxicabs are supposed to carry two passengers at 15 cents a mile. When the motor-boats now plying for public hire in the harbor first appeared people asked how they could compete with the native rowboats or sampans. They soon proved to be much more popular. Quite a number of motor-boat engines have been imported, not only into Hongkong, but to other places in South China, as a result of the success of those that have plied for hire in the local harbor.

#### The New Canton

A recent visit to Canton showed that the Chinese municipal authorities there are continuing the plan for the construction of wide roads, or "maloos," as they are called, in that city. Creeks are being filled in. That will make mechanically propelled vehicles possible. There is also a revival of the idea of a bridge across the wide river at Canton. It is said that the municipality has prepared plans and has estimated the cost of such a bridge at about a quarter of a million pounds sterling. The only difficulty is the dearth of money in Canton. However, as the Chinese merchants in Hongkong very promptly guaranteed a fund of about a quarter of a million pounds sterling to ease the recent "general strike" negotiations, it is not improbable that money could be raised in Canton for the proposed bridge if the merchants could be persuaded that the commerce of the city would benefit.

Every new road and bridge that is built in South China is sure to improve trade. The immediate effect will be to revolutionize the methods of transport. The sedan chair and the man-pulled ricsha will pass away from the Far East as surely as the sedan chair has disappeared from London.

### Tractors in China

CONSUL-General Heintzleman, Hankow, reports that there has just arrived at Hankow a shipment of agricultural machinery and implements from the United States. The order was placed through a local American concern in connection with the development, by a group of Chinese capitalists of Hankow, of 13,000 acres of land in northern Honan, south of and bordering on the Yellow River.

The promoters of the enterprise intend first to undertake the cultivation of peanuts. The shipment consists of one wheel-type tractor, two disk harrows and two two-furrow gang plows. This is a trial purchase and if the machinery and supplies prove satisfactory additional orders will be placed; moreover, other farming implements and harvesting machines of various kinds will be ordered as required.

### Motor Omnibus Laws in Singapore

THE president states that an amendment of the motor omnibus bye-laws is brought forward for the enforcement of regulations for the testing and examination of motor omnibuses, and moves that the following amendment be passed.

After the first day of April, 1922, "no vehicle intended for use as a motor omnibus shall be licensed which has not been inspected, tested and approved by the municipal superintendent of machinery and which does not further comply with the regulations set out in the following schedule:—

#### Regulations for Motor Omnibuses

Steering Gear.—Must not be more than 1 turn slack.

Omnibus Bodies.—For one ton chassis and under the overhang must not be more than one-fourth of the wheel base, the overhang to be measured from centre of rear axle to back of body, neglecting steps. For chassis over one ton the overhang at rear must not be more than 5 inches per foot of wheel base, the overhang to be measured as above.

Width.—The body must not extend more than 6 inches outside the other rims of rear wheels.

Height.—The over-all height of body from ground level must not be more than 8-ft. 9-in. for one ton chassis or under and not more than 9-ft. 3-in. for chassis over one ton. The height from floor of bus to ceiling must not be less than 5-ft. 6-in. Top of floor to be not more than  $7\frac{1}{2}$ -in. above top of chassis frame. Floor boards to be not less than  $\frac{7}{8}$ -in. thick.

Seating Accommodation.—The minimum seating space per passenger must not be less than 15 inches, except that a seat for two passengers only may be of a minimum length of 27 inches. The maximum height of seat must no exceed 17½ inches measured from floor to top of seat.

Construction of Body.—When chassis frame is less than  $\frac{1}{4}$  inch thick, the cross members must rest on fore and aft runners not less the 3-in. deep by  $2\frac{1}{2}$ -in.

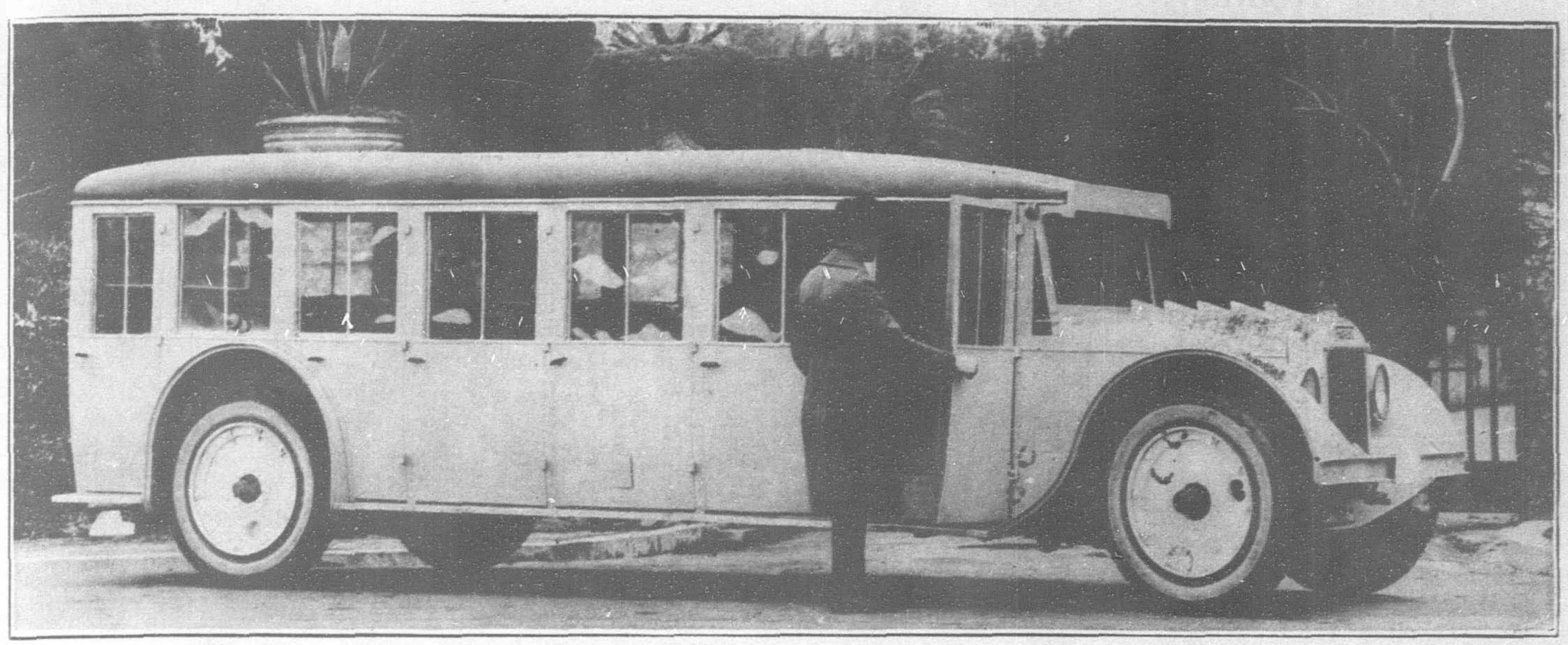
Each runner to be secured to chassis frame by not less than 3 clips. The clips to be not less than  $\frac{5}{8}$ -in. iron with a plate of not less than 2-in. by  $\frac{1}{2}$ -in. on the bottom side held in position by nuts. When the clips pass round the frame a wooden block must be tightly fitted into the frame in such a manner that it is impossible to remove it without taking off the clip. The body must rest on cross members spaced not more than 3 feet apart.

The cross members to be not less than 3-in. deep by  $2\frac{1}{2}$ -in. cross section and secured to the fore and aft runners by bolts of not less than  $\frac{1}{2}$ -in. dia., washers to be fitted under head of bolt and nut.

The fore and aft frame of the body must not be less than  $2\frac{1}{2}$ -in. deep by 3-in. cross section timber properly secured to the cross members by bolts of not less than  $\frac{1}{2}$ -in. diameter, iron washers to be fitted under head and nut of bolts. The upright member of the body must be properly secured to cross and longitudinal frame by angle bars or gusset plates. The top of body must be secured to the sides of body in a like manner.

No omnibus when complete in running order for the road but without passengers, driver or conductor shall weigh more than 4 tons. Ample clearance must be provided between top of wheels and body, if necessary by providing buckets in floor.

N.B.—Where sizes are given it is assumed that best quality, chengie, balau or teak wood are used and other materials are of the best and strongest kinds and if such are not used sizes must be correspondingly increased.



The Popular Fageol 20 Passenger "Safety Bus" on 188-in. Wheelbase Chassis.

## Safety Bus for Chinese Roads

HE rapid construction of motor roads in China and elsewhere in the Far East is calling more and more for a passenger bus that permits of easy entrance and exit, and ability to crowd as many passengers as possible in a limited space. Highway transportation which has made such phenomenal strides in other parts of the world, is destined to be the solution to traffic congestion in China, and there more than in any other part of the world, luxury must give place to carrying capacity. The greatest efficiency cannot be obtained by the use of rebuilt touring cars or trucks. A specially designed bus built up on a special chassis seems the only manner by which a passenger bus can be turned out to meet peculiar Chinese and Asiatic requirements, and here the Fageol Motors Company, of Oakland, California, claim to have scored over other manufacturers.

The Fageol 20-passenger safety bus an on 188-in. wheelbase chassis, with its ease of entrance obtained in the "Safety" stage by the use of a wide running board, extending inside the doors and body sides invites the confidence of people who are otherwise adverse to motor transportation. This passenger stage is designed for hard service at low operating expense. It is neither a truck which has been equipped with a stage body, nor is it a rebuilt passenger car, but a stage body on a stage chassis, built for running 100,000 miles without an overhauling. The Fageol special school bus, the latest addition to their line, is peculiarly adapted for ordinary highway traffic in China, being designed for safety, strength, dependability and economy, providing every possible protection for the passenger.

The future popularity motor transportation, especially in China, depends upon safety, perhaps more than any other consideration. The Fageol "safety" bus is built with a very low centre of gravity and a wide tread of 70-in. This freedom from danger of overturning is of vital importance to both passenger and stage operator.

These buses are equipped with a Fageol Hall-Scott, 4 water cooled cylinders cast in block. Detachable overhead valve and cam shaft head with single cam for both intake and exhaust. Bore  $4\frac{1}{4}$ -in. by  $5\frac{1}{2}$ -in. stroke. Horse-power, 28.9 S. A. E. rating, actual 62 h.p. at 1,800 r.p.m. Three point suspension on thermoid pads.

Maximum motor speed of 1,800 r.p.m. controlled by enclosed governor.

### Passenger Autos in China

THERE are 6,866 passenger cars, 437 trucks and 792 motor cycles in the various cities of China, according to a conservative estimate, based on the most reliable figures available, by Commercial Attaché Arnold, Peking. It is difficult to ascertain what percentage of the cars are of American make, but the fact that the United States furnished 47 per cent. of the motor vehicles imported in 1918 (641,346 Haikwan taels worth), 59 per cent. of those imported in 1919 (1,404,388 taels worth), and 57 per cent. of the imports in 1920 (amounting to 2,191,644 taels) may serve as the basis of an estimate.

Shanghai had on January 1, 1922, a motor population of 3,242 passenger cars (of which 30 were electric) and 536 motor trucks. The total 3,778 constitutes an increase of approximately 30 per cent. over the number in use on January 1, 1921. It has been calculated that approximately 87 per cent. of these cars are American, of which 10 well-known American makes contitute 71 per cent.

The following table shows the growth in the number of motor vehicles licensed in fhe French concession, Shanghai, from 1913 to 1921:—

Kinds of ve	hicles		1913	1914	1915	1916	1917	1918	1919	1920	1921
Motor cars:			20	104	105	100	070	000	240	*00	000
Private	***	***	89	104	135	180	272	336	346	503	698
Public		***		-	77	83	97	121	192	250	307
Commercial	***		3	3	2	4	6	6	6	11	17
Trucks	***		-				-	_	2	127	206
Motor cycles		•••	4	5	6	7	11	16	18	31	, 34
Total			96	112	220	274	386	479	564	922	1,262

These figures, while comprising only a part of the city of Shanghai, illustrate the increasing popularity of motor vehicles.

#### Good Roads in China

The responsibility for road construction in China is vested in so many authorities, governmental, provincial, or private, that a complete record is impossible to obtain. However, all the particulars in this survey have been verified either from a responsible government department or from the offices of private road constructors, and the list may be taken as the foundation of a complete statement which, as time goes on, it will be possible to publish.

		nich, as time goes	and the second of the second o	-	-		
		owing is a list of			747		Shanghai
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	tion	•					Changshu
	From	To	Condition 1	Mileage	Builde	r	
	CHIHLI						Changshu
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	Peking	T'angshan	3.9		22		TZ
	Kalgan	Urga	2.3	643	Ministry of		Kuyung
					municati	ons	Kiangpu
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			struction				Soochow
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					municati	ons	Kiangying
	Kalgan	Shantu	22	125	22		Yangssuc
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		Road and branch		123	American	red	Hangehov
					cross		Chaoan
	Chefoo	Weihaiwei	Projected				Onaoan
	Chefoo	Haiyang	2.2				Fengshih
	Tehchow	Lingtsing and					Nanyu
		Kwantao	2.2				Haiteng
	SHANSI						Fuan
	e/	Taiku	Constructed				Kiangsi
	Pingting	Cheng-Tai Rly.	3.3	78	American	red	Nanchang
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	Kueihua	Paotowchen	TT 7				Nanchang
	Tatung	Taiyuan	Under con-				Nanchang
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	U	Kohsien	Projected				Nanchang
		Pingyang Fenchow	99				KWANGS
	00	Liaochow	3.5				Lungchow
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	Kweiteh	Pochow					Sunwui
	(Honan)	(Anhwei)	5.9	45	Private		Sheklung
-		Sian (Shensi)	>>	156	Provincial		Lohfoshan

From	To	Condition Mil	eage	Builder
SHENSI				
Sian	Tungkwan	Projected	100	Governmental
Tungkwan	Shenchow	Under con-		
Lungkwan	(Honan)	struction	54	Private
KIANGSU	(IIOIIaii)	Suluculon	OI	1114000
	TWooden	Constanted		Provincial
Shanghai	Woosung	Constructed	00	
Susieh	Hsuchow	9.9	80	Private
Nanking	Tangshan Hot			
	Springs	3.3	100	Private
Shanghai	Cheling	2.2	23	Provincial
Shanghai	Tachang	3.3		Private
Changshu	Liuho	Under con-		
		struction		
Changshu	Taitsang	9.9	23	Private
Tantu	Tanyang and			
	Nanking	Projected		Provincial
Kuyung	Kingtan and	22010000		2 20 7 22202002
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TZ:	Nanking	9.9		5.5
Kiangpu	Luho and			
	Nanking			33 Th. 1
Chinkiang	Tsingkiang	2.2		Private
Tsingkiang	Nantungchow	2.9		9.9
Nantungcho	w Haimen	Constructed	į	
Soochow	Taitsang			
Soochow	Fooshanchen	Projected		9.5
Tsingkiang	Hsuchow			9.
Tsingkiang	Haichow	2.7		
Tsingkiang	Pukow	9.9		2.2
Soochow	Huchow	2.7	245	, , ,
		9.9	A STATE OF THE STA	22
Yangehow	Kwachow	2.2	11	***
Kiangying	Wusih	5.5		3.3
Yangssuchia	o Lulichiao	,,,		. 22
CHEKIANG				
Kashing	Chapu	,,,		
Ningpo	Tzeki & Chinh	ai ",		
Huchow	Kwangteh	2.5	35	
Haining	Changan station			
Sincheng-	Changchen of	. , ,,,		
kwan	Shangyu		67	Provincial
	Buangyu	2.9	01	T X O V ZIZOZUIZ
range	W. l			
Hangehow	Yuhang	5.5	OF	
Changshan	Yushan	2.7	27	
	(Kiangsi)			
Hangehow	Shanghai	3.7		Private and pro-
				vincial
Chaoan	Futing	Under con-		
,		struction	350	Provincial
Fengshih	Kwangtseh	Projected	505	,,
Nanyu	Hokow		342	
Haiteng	Wuping	5.5	178	2.7
		2.9		9.7
Fuan	Shaowu	2.5	238	5.7
KIANGSI	77 1		08.	
Nanchang	Kanchow	: 2	275	9.9
Nanchang	Kwangsin	3.3		57
Nanchang	Ningtu	5.5		2.5
Nanchang	Kingtehchen	2.2		2.7
Nanchang	Shangkao	2.2		22
Nanchang	Pinghsiang	" Total 1	,200	2.7
KWANGSI	,			
Lungchow	Shuikow	Constructed		2.2
	Wuchow	Projected		
Nanning		riojecteu		
Kweilin	Monkong	2.2		
KWANGTUNG		** *		
Sunwui	Kongmon	Under con-		
		struction		2.7
Sunwui	Pakhoi	Projected		22
Sheklung	Lohfoshan	2.2		22
	Tsengshing			22

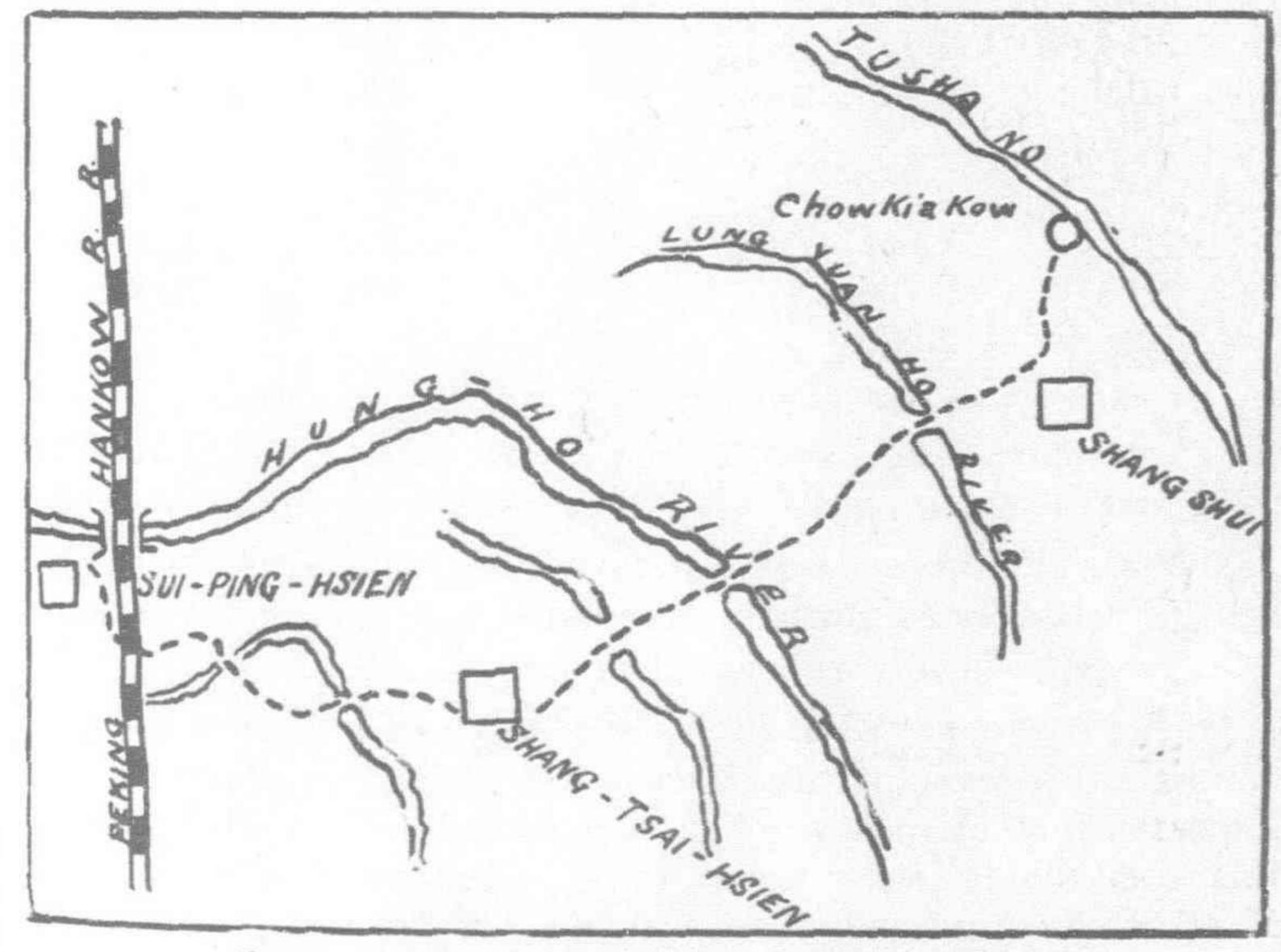
From	To $C$	ondition Mileage		Builder
Szechuan Chengtu	Yachow	Constructed		Provincial
Chengtu	Kwanhsien	22		,,
Chengtu	Chungking	Projected	265	,,
Chengtu	Pachow	,,,		,,
Chengtu	Wanhsien	55		22
Chengtu	Kwangyuan	,,,		,,,
Changsha	Siangtan	Constructed		,,,
Hsifeng	Kaiyuan	Projected		
Kwangteh-				
chow	Szean	,,,		>>
Wuhu	Suanchen & Kwangte	eh ,,		,,
Pochow	Suchow		0	22
Anking	Luan	2.2		,,
O				

Distances, where given, are in Engl ish miles.

(Government Bureau of Economic Information.)

### Suiping-Chowkiakow Motor Road

THE magistrate of Shangtsai-hsien, Honan, is planning to construct an automobile road from Suiping to Chowkiakow, with the city of Shangtsai-hsien as the centre. The distance to the Peking-Hankow railway station at Suiping on the northwest, is about 57 li, and to Chowkiakow on the north-east, about 110 li. The road will have a width of 16-ft. and be macadamized. Ditches will be dug on both sides and trees planted. In ad-



Sketch Showing Line of Projected Motor Road

dition to the automobile road, there will be built another byway, l-ft. lower than the minor road, 6-ft. wide, for heavy traffic.

It is estimated that the section from Shangtsai to Suiping (57 li) will call for 5,000 fong of earth filling as a cost of \$400, 10,000 fong of gravel at \$25,000, and 500 fong of sand at \$500, and from Shangtsai to Chowkiakow (110 li) 10,000 fong of fill at \$800, 19,000 fong of gravel at \$43,500 and 1,000 fong of sand at \$1,000, or a total of \$71,200 to complete the whole road. In the above figures the cost of bridges is not included.

When the scheme is approved, a road construction department will be created to carry out the work; and when completed, the department will enjoy an exclusive privilege for operating a motor transportation service thereon. For private cars and motor trucks a toll will be levied and the proceeds used for maintenance.

### Market for Solid Tires in Tientsin, China

THERE is but a limited market for trucks in the Tientsin consular district, the few in use being equipped with solid tires. Until more trucks are in use, so as to enable the buyet to judge the merits as to price, durability and general advantages, it is believed by local dealers that solid tires for trucks will not find a large market in this region. It is estimated that there are about 60 motor trucks in the district, less than 20 of which are in operation. The remainder are either still in stock or are unfit for use.

The future success of the trade in motor trucks in North China depends entirely upon whether or not suitable roads are to be built. Those suitable for motor vehicles in Tientsin, Peking and their environs do not exceed 130 miles in length. Motor cars and trucks are operating on the Gobi Desert run at present, but until the highways are improved the journey, especially for heavily loaded motor trucks, will prove difficult and hazardous. Also, as regards the commercial feasibility of the use of trucks on this route, it is questionable whether they can compete successfully, on account of the low cost of camel and cart hire.

The use of motor trucks in the transport of passengers, to be operated as feeders for railway lines, has possibilities, but this again depends upon the construction of good roads.

Regarding the use of motor trucks in Tientsin, it may be stated that there is likely to be very little demand, for the reason that nearly all the mercantile houses are situated near to the wharf and the railway station, and coolie hire for the carriage of cargo to and from the bund and the railway station is very reasonable. No motor truck could ever hope to compete with coolie hire on a short haul.

Peking is not a commercial centre, and although the distances are much greater than in Tientsin and the mileage of good roads much larger, still there is some doubt as to motor trucks being used to any extent in the city for a long time to come. Motor cars are increasing in number, and no doubt in a few years the use of motor trucks in the delivery of coal and other supplies about the city will become more general. Furthermore, there will eventually be a demand for military motor trucks and motor trucks for bus lines to points outside of Tientsin and Peking. The sale of automobiles, motor trucks, tires and accessories is being vigorously pushed in this district. The advertising commonly resorted to embraces newspapers, both native and foreign, moving-picture screens, billboards etc.

## Franklin Touring Car Makes Record in China

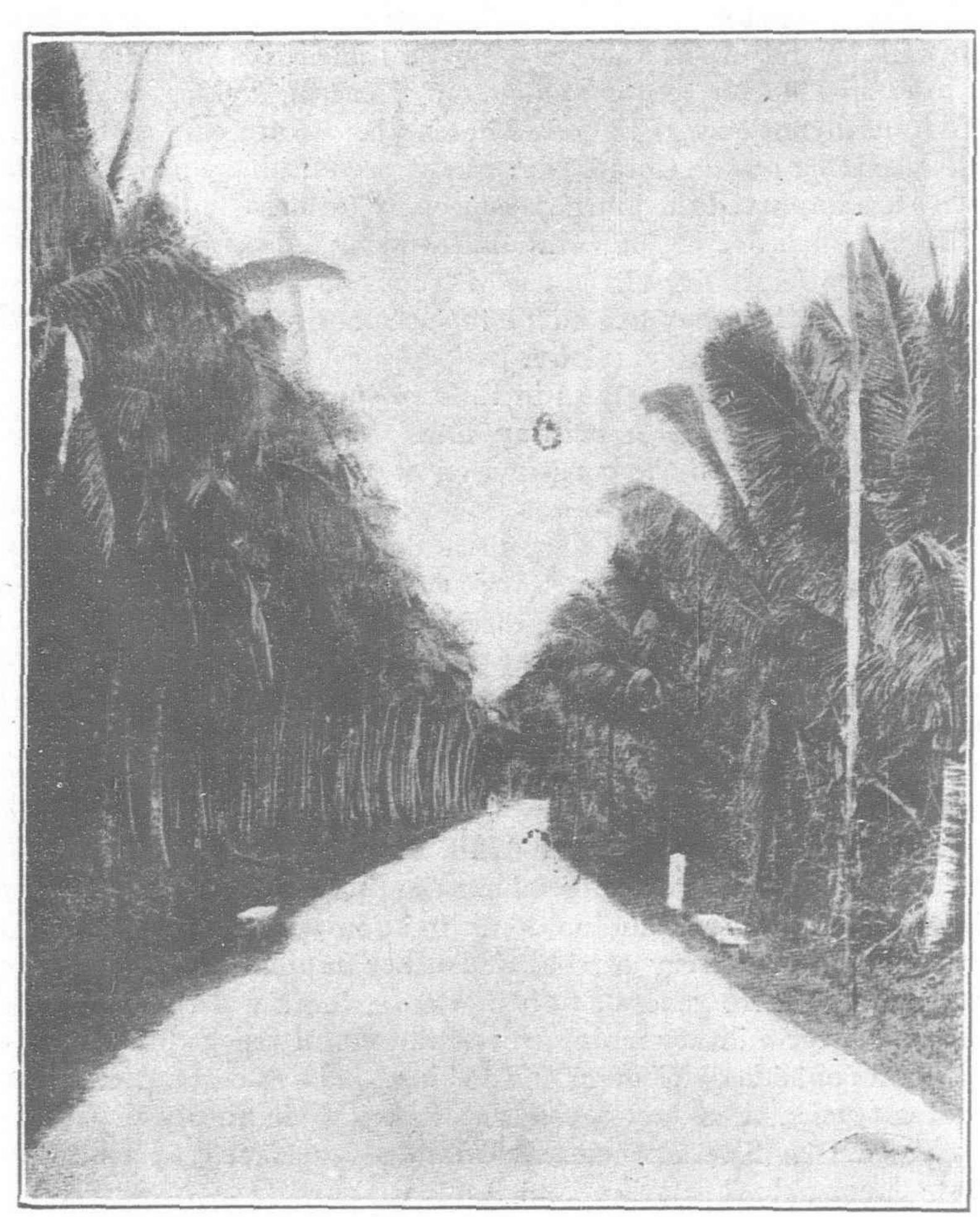
A FRANKLIN touring car driven by F. S. Williams broke all previous road records between Tientsin and Peking, China, on March 2, when he made the trip in three hours and nine minutes from East Gate, Peking, to the governor's yamên, Tientsin. The distance between the two cities is 80 miles, and over smooth American highways the time record set up would be nothing out of the ordinary. So far as this particular run is concerned, however, the time is deemed remarkable because the road, which is of none too good construction is only about two-thirds finished, the balance of the route taking the tourists over dykes, along an exceedingly rough car trail or road badly cut up by deep ruts.

Because the Franklin is air-cooled, it has long been a favorite with the military authorities in China, who find they can operate an air-cooled car over stretches of hundreds of miles of desert without stopping "to give it a drink." Until recently it used to take 40 days to make the 700-mile trip across the great desert of Gobi by caravan. The trip is now made easily in four days in a Franklin.

## Motors and Roads in the Philippines

ITH a total of about 3,000 miles of first-class roads, the Philippine Islands had 13,341 motor vehicles registered with the bureau of public works at the end of 1921, an increase of 1,865 cars over the preceding year. China possesses 7,000 passenger cars according the latest correlation, which gives the palm to the Philippines.

to the latest compilation, which gives the palm to the Philippines for being the most thoroughly motorized part of the Orient.



The beautiful palm fronded main South Road-leading from Manila to Toyabas

Motor vehicles registered, with the bureau of public works at the end of 1921, was as follows:

the chu of real, was as toll	1440	-			
	4	Old	New	Total	
Private cars		5,446	1,020	6,466	
For hire cars		1,838	228	2,066	
Public utility cars		172	5	177	
Private trucks		726	146	872	
For hire trucks		407	52	459	
Public utility trucks		685	61	746	
Garage cars		364	33	397	
Garage trucks		207	13	220	
Government cars		326	49	375	
Government trucks		383	67	450	
Private motorcycles		682	75	757	
Government motorcycles		240	116	356	
Total		11,476	1,865	13,341	

The general business depression was also felt by the automobile trade of the islands. The majority of the cars sold in the past few years have gone to the Filipino planters who with good crops, high prices and plenty of money ordered large numbers of expensive cars which found their way into the country. In addition to this luxury demand, large numbers of motor trucks were sold for freight

and passenger transportation purposes, creating a situation seriously menacing the earning capacity of the railways, which are owned and operated by the government. This has had the effect of creating official hostility towards all new public utility motor transportation, evidenced in the decreased number of licences issued during 1921 for such purposes.

#### The Road System

The road system has reached the point where maintenance is a serious problem and engineers are puzzled over the question of the proper kind of road. At present macadam is in the lead, but the heavy traffic, motor vehicles and bull carts, breaks up the surfacing rapidly. The heavy rains in the rainy season do immense damage, while the long dry seasons permit rapid wear through blowing dust.

The status of roads and the history of road building can be understood through a study of the following table from the bureau of public works:—

#### PHILIPPINE PUBLIC WORKS STATISTICS

		Total Mi	ileage of Roa	ds in the Phili	ppines
		First	Increase	Second	Third
		Class Roads	Per cent.	Class Roads	Class Roa
1907		(a) 303			
1908		423	40		
1909	٠,	609	44		
1910		764	25	(a) 641	(a)2,074
1911		987	29	664	1,837
1912		1,143	16	1,342	1,999
1913		1,303	14	1,264	1,938
1914		1,593	22	1,258	1,787
1915		1,906	20	1,294	1,896
1916		2,137	12	1,271	2,138
1917		2,323	9	1,278	2,109
1918		2,542	9	1,253	1,944
1919		2,796	10	1,234	1,932
1920		2,920	4	1,266	1,914

(a) No accurate statistics before 1907 and 1910, respectively.

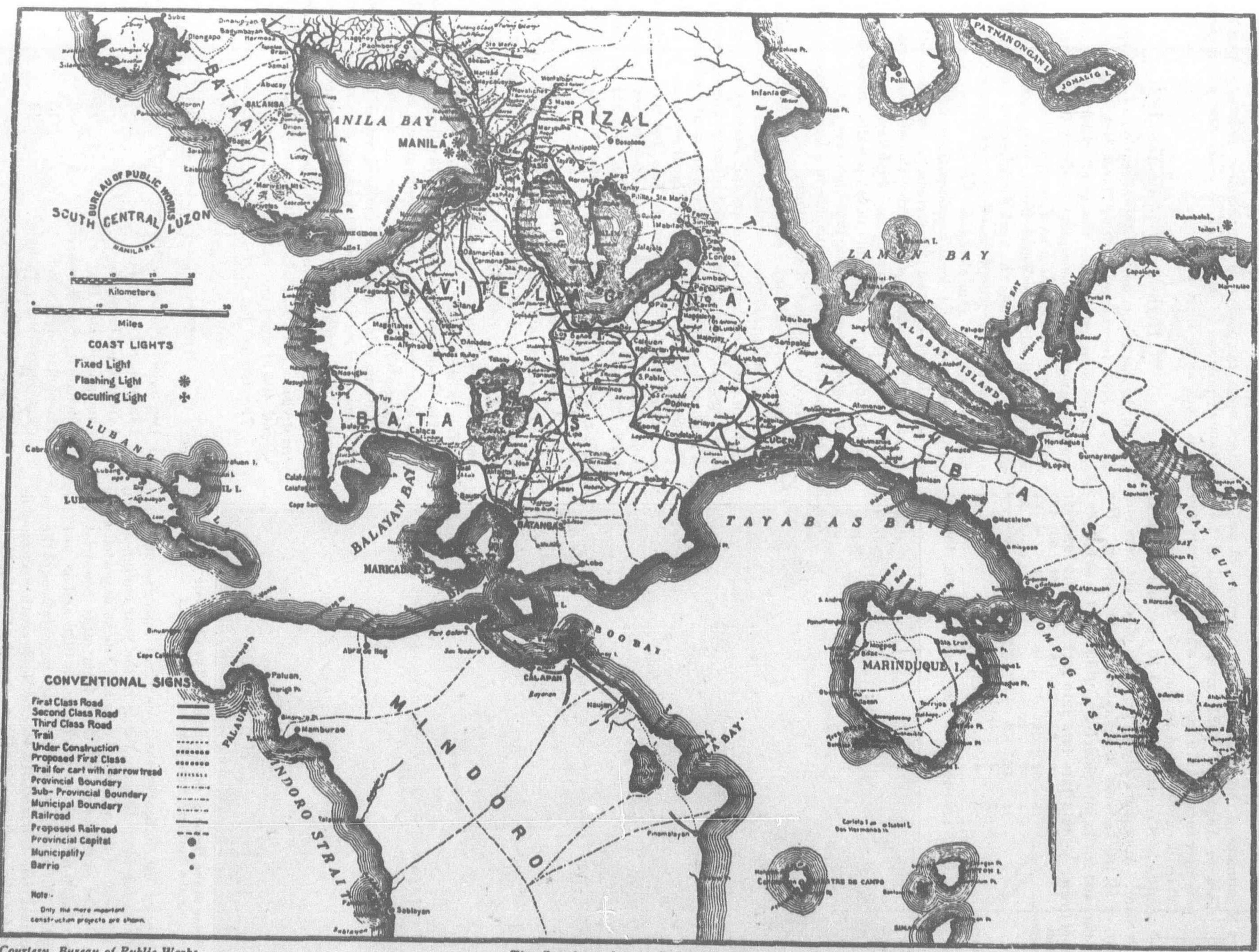
Years preceding 1914 are for twelve months ending June 30, 1914, and following years are for twelve months ending December 31.

Note.—First-class roads in this table include not only firstclass roads officially designated but also first-class roads not officially designated as such.

Luzon, the largest of the islands, will give a good idea of the importance of these new roads as a factor in the development of this remarkably rich territory. The main south road from Manila to Lucban is also one of scenic beauty passing through the coconut garden of the Philippines, where as far as the eye can reach are groves of these slim fronded trees affording an ever entrancing vista, while far to the east stands cloud capped Banahao, monarch of Philippine mountains. The trip from Manila to Lukban and return a distance of 100 miles can easily be made in the daylight hours of a single day.

#### Aviation-France

The traffic of the Bourget Aero Station (near Paris) is increasing considerably, according to La Journee Industrielle of April 9-10. In March, 1922 there were recorded 315 airplanes, carrying 846 passengers and 21,908 kilos of merchandise. The corresponding figures for March, 1921, were 250 airplanes with 681 passengers and 8,725 kilos of merchandise.



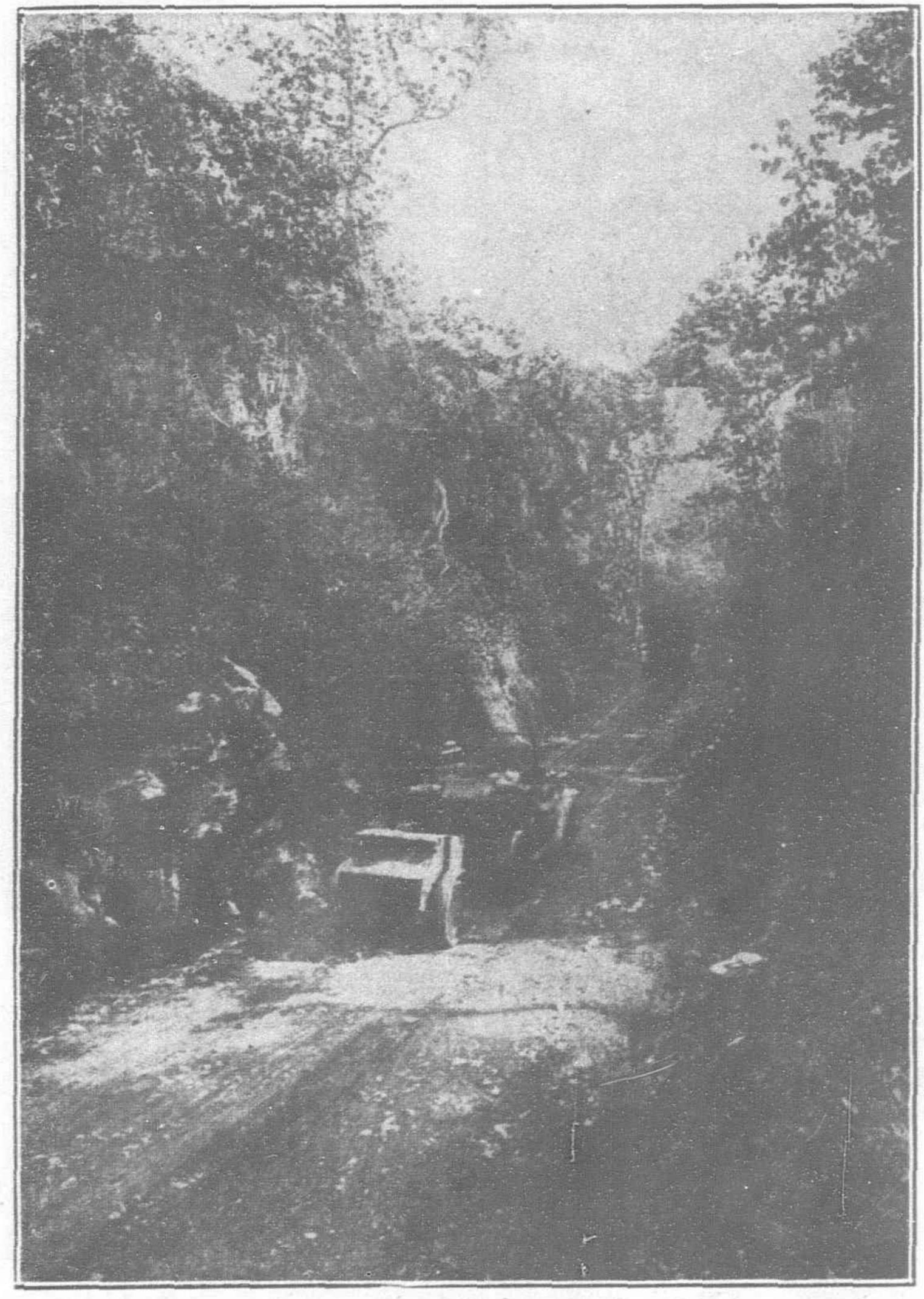
Courtesy, Bureau of Public Works

The Southern Luzon Road System

## Motors and Roads in Siam

N estimate of the number of motor vehicles in use in Siam to August 15, 1921, gives the total of 1,435 passenger cars and 170 trucks, of which 1,400 cars and 130 trucks were in use in Bangkok, 25 cars and 10 trucks in Siamese Malaya and 10 cars and 30 trucks in northern Siam. Approximately 97 per cent. of all the cars and 75 per cent. of all trucks were in operation in the capital. The imports of cars and trucks into Siam from 1913 to 1921 is as follows:

Countries of O	rigin.	1913	1914	1915	1916	1917	1918	1919	1920	1921
United States		28	76	25	70	137	102	161	95	185
United Kingdom		46	51	24	17	18	14	4	6	64
Transa		4	7	2				_		35
0.		41	48	19				_	-	9
T4 - 7		3	4	4	1	3	1		-	4
Other countries		3	4	2	1	2	3	5	5	24
Total		125	190	76	89	160	120	170	106	321



The Motor in the Home of the Elephants. The Cliff Gate (Km 50) on the Northern State Highway of Siam No. 3

The above list indicates that American manufacturers are meeting increasing competition. While in the year ending March, 1919, 95 per cent. of the number of cars and trucks imported came from the United States and 5 per cent. from other countries, the proportion was 90 per cent. to 10 per cent. in 1920 and 58 to 42 per cent. in 1921. An important addition to the importations of the year was the arrival from England of a second Merryweather automobile fire engine for the gendarmerie department of 45-50 brake horse-power capable of delivering 300 gallons per minute.

The development of the road program promises to give a stimulus to the automobile business in Siam. The example of British Malaya to the south with its magnificent system of roads and motor transport which acts as feeders to the railways has had a marked

effect upon the policy of the Siamese railway department, and although progress is slow, in three years substantial progress has been made along these lines.

#### Highway Reports for 1921

In the last report on the administration of the department of ways in Siam for the year ending March 31st, 1922, the minister of communications emphasizes the great reduction in the costs of transportation with a consequent tendency to a greater volume of traffic all over that country as a result of the road program which is now in its third year. This is held to fully justify the government measures for continuing the work for improved communications.

Previous to the adoption of the new program, the confinement of highway administration for so many years within the narrow framework of local considerations had militated against the adoption of a broad comprehensive outlook which transport requires. Construction work under the new program, especially in the case of certain long-distance highways, has not yet had the time to advance so as to fully develop traffic and trading possibilities, but signs are not wanting that highways suitable for rapid forms of transport are going to contribute in a large measure to the rapid economic development of the country.

During the year under survey, Purachatra, the commissioner-general of state railways in charge of the department of ways, made an extended trip to Europe and America for the purpose of studying road-making practice and investigating the different types of road-making machinery that could be used to advantage in Siam. The total amount expended for the three years in road-making machinery and tools amounted to Tcls. 144,869, and for the year Tcls. 66,052. During the year under review the sum of Tcls. 1,470,127 was expended, of which Tcls. 604,551 was for construction account, Tcls. 532,598 for improvements, and Tcls. 270,241 for maintenance proper.

To the southern highway division containing the more important roads a sum of Tcls. 719,434 was devoted, to the northern, Tcls. 521,308, and to the central system containing mostly cart tracks, Tcls. 142,700. The total amount expended on highways under the new administration for the three complete years amounted to Tcls. 3,515,984.53.

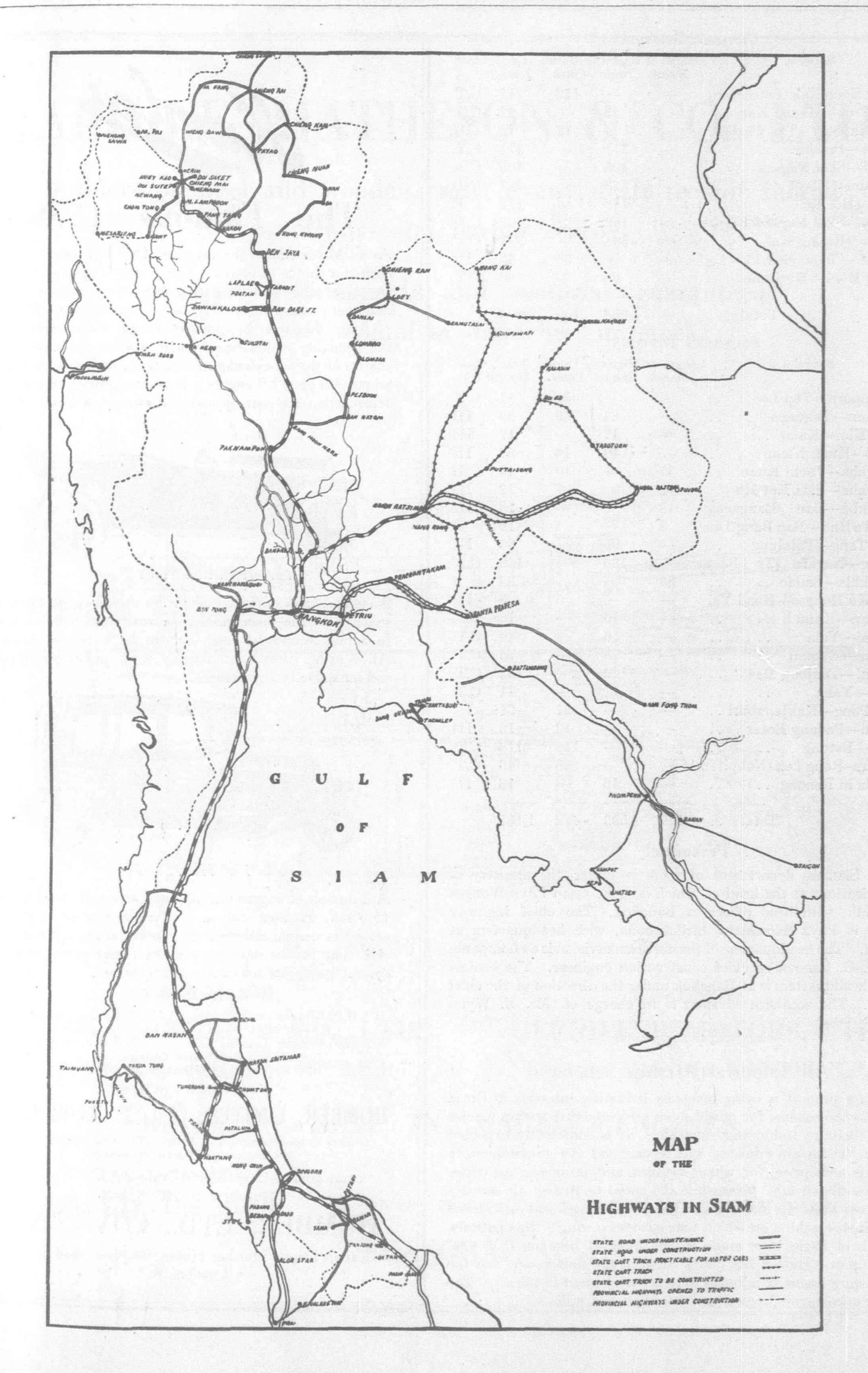
The report shows a total of 3,676 kilometres of all classes of roads under maintenance, improvement and construction in Siam, an increase of 109 kilometres over the preceding year. Of this total 420 kms. is in the northern division, with 57 kms. of second class, 290 kms. of third class and 73 kms. of cart tracks. The central division with 2,095 kms. has no first or second-class roads, but has 47 kms. of third class and 2,048 kms. of cart tracks. The southern division, with a total of 1,161 kms. has 83 kms. of first, 57 of second, 406 of third and 615 kms. of cart tracks.

The detailed list of the state highways is as follows:

#### NORTHERN DIVISION

No.	Between	Length of Maint.	Highway Impro.	Under Const.	Total Length	Class.
1	Den Jaya-Phrae	25			25	11
. 2	Lampun-Chiengmai	28		-	28	II
3	Lampang—Chiengrai	39		206	245	Ш
4	Chiengmai-Mae Rim		15		15	C.T.
	Chiengmai-San Kambaeng	4	9		13	III
	Chiengmai-Doi Saket		10		19	C.T.
	Chiengmai-Mae Tachang		14		14	III
	Swankaloke-Sukodai			39	39	C.T.
	Utaradit-Phra Taen-Laplae		22		22	III
	Total	96	79	245	420	

The old state highway No. 9 (station to Lampang) has been merged into northern state highway No. 3 and forms part thereof.



#### CENTRAL DIVISION

		DI DIVIN	TOTA			
No.	Between	Length of Maint.	Highway Impro.	Under Const.	Total Length	
1	Bang Moon Nak-Petchabur	1		112	112	C.T.
	Pak Preo-Hnong Kae		22		22	C.T.
3	Chandhaburi—Tha Chalael	) —		12	12	III
5	Korat-Prachin		371		371	C.T.
6	Korat-Skol Nagara		405		405	C.T.
7	Bantum—Ubol		353		353	C.T.
8	Ubol—Roi Et	_	172	-	172	C.T.
9	Udara—Skol Nagara		162		162	C.T.
10	Korat-Knong Kai		391		391	C.T.
11	Pimul—Chong Mek Pass			35	35	III
12	Nang Rong—Buriram		60		60	C.T.
		-				
	Total		1,936	159	2,095	

#### SOUTHERN DIVISION

No.	Between	Length of Maint.	Highway Impro.		Total Length	Class,
1	Chumporn—Tap Lee			51	51	C.T.
2	Thanun—Takuapa		24	69	93	III
3	Kok Kloi-Kalai		17		17	III
4	Setul-Kuan Niang		40	46	86	III
5	Tongkha-Laem Kuan	35		10	45	II
6	Tongkha-Sala Ket Ho	12			12	III
7	Tongkha-Ban Rangaeng	18			18	III
8	Ban Ta Rua-Ban Bang Tao	8		4	12	II
9	Kan Tang—Patalung		96		96	III
10	Trang-Nagara (Ta Bae)		136		136	C.T.
11	Songkhla-Sadao	83		-	83	I
12	Ban Ko Hongse—Haad Yai			5	5	III
13	Raman—Kabu		10	-	10	C.T.
14	Patani—Yala		46		46	C.T.
15	Patani-Raman	-	75	-	75	C.T.
16	Patani-Tanjong Mas	-	122	-	122	C.T.
	Yala—Yaha		11	-	11	C.T.
18	Ban Pong-Kanjanaburi			51	51	III
	Sadao—Padang Besar		-	12	12	III
21	Yala—Betong		Commission (	118	118	C.T.
22	Nagara-Rong Lek (Nobpitar	n) —	-	46	46	C.T.
	Roads in Renong		16		16	III
.94						
	Total	156	593	412	1,161	

#### Personnel

The Siamese department of ways is under the ministry of communications at the head of which is H.E. Chao Phya Wongsa Nuprabadh, with head offices at Bangkok. The chief highway engineer is Phya Sarasastra Sirilakshana, with headquarters at Bangkok. The headquarters of the northern division is at Lampang, with Mr. G. Canova as chief construction engineer. The central division headquarters is at Bangkok under the direction of the chief engineer. The southern division is in charge of Mr. E. Wyon Smith.

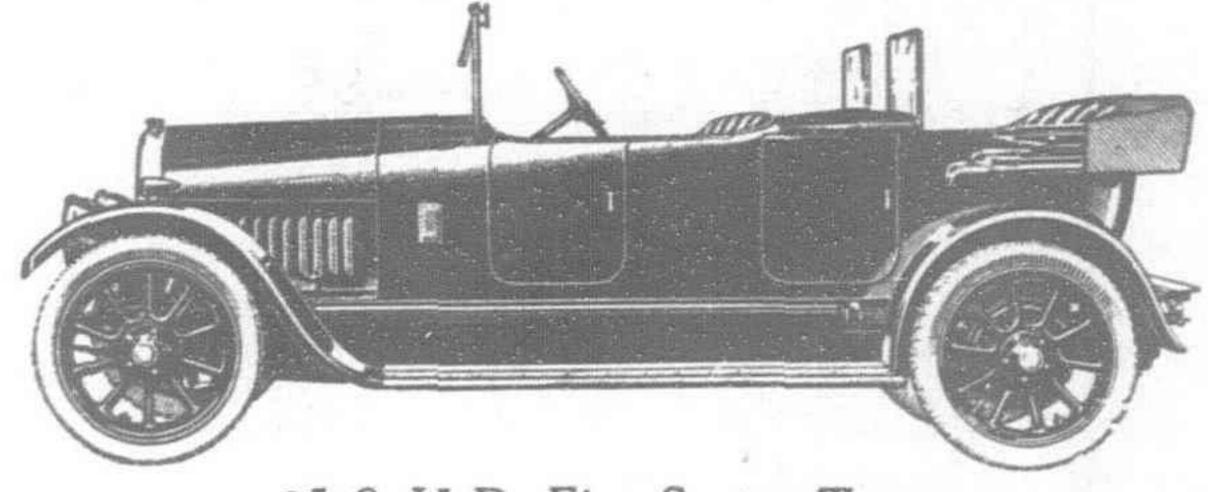
#### All Imperial Airship Scheme

Strong support is being given by industrial interests in Great Britain to the scheme for establishing a commercial airship service between Britain, India and Australia. It is confidently expected that the British air ministry will recommend the government to assist this enterprise, for which detailed and promising estimates have been drawn up. Meanwhile the speed of British air services to and from France is increasing. Recently a record was established by a British machine on which four successive single trips between London and Paris were made in the interval between 6.55 a.m. and 5.40 p.m. Out of  $10\frac{3}{4}$  hours between the first ascent and the last descent 8 hours 52 minutes were actually spent in the air. The total distance covered was about one thousand miles.



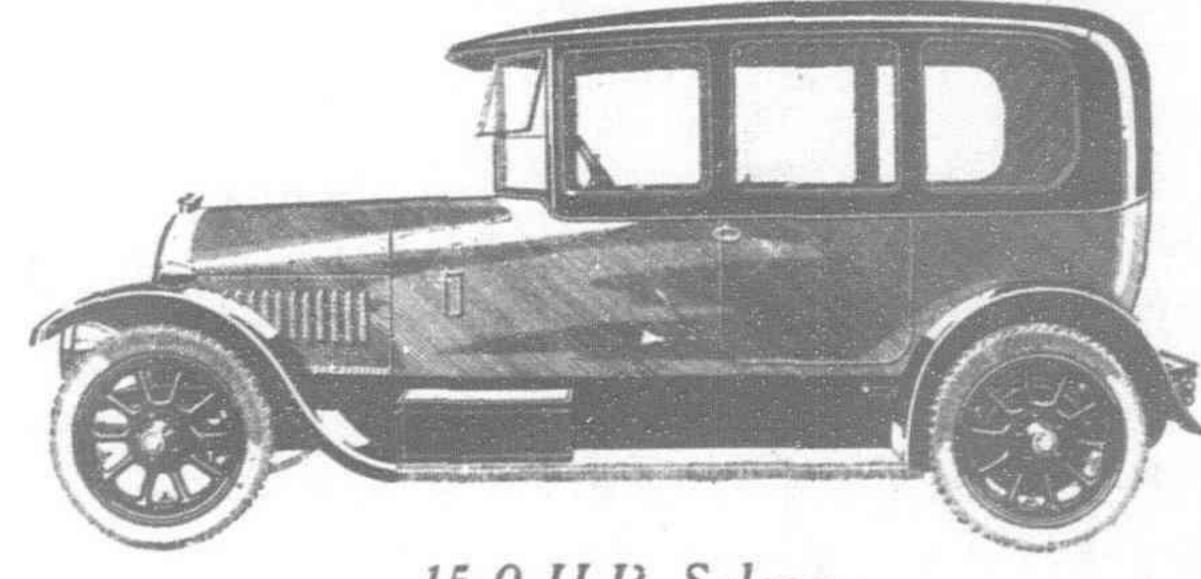
### The Famous 15.9s

At all Motor Shows the Humber 15.9 h.p. models have elicited a chorus of praise. The Motor Editor of Country Life made a striking reference to the engine. "A smoother running engine," he said, "than the four-cylinder 15.9 h.p. Humber it would be difficult to conceive, and the flexibility makes one wonder whether the undoubted charms of the six-cylinder are really unobtainable by other means. The 15.9 engine is large enough to satisfy every demand that the normally-minded owner can make."



15.9 H.P. Five Seater Tourer

An entirely new note is struck in the All-Weather Feature attached to the open models—a real boon to Motorists. In a few seconds an open car can be converted into an All-Weather vehicle, thoroughly wind and weatherproof and attractive in appearance.



15.9 H.P. Saloon

A Triumph of engineering skill and accomplishment is the 15.9 h.p. Humber Saloon. It is the best of its kind; perfect in design, material, and workmanship, and remarkable alike for the superiority of its engine power, ease of control, and great refinement in appearance.

#### Models for 1922

11.4 H.P. 2-Seater (with double 11.4 H.P. Coupe (with double Dicky Seat)

11.4 H.P. 4-Seater Touring Car 11.4 H.P. Saloon

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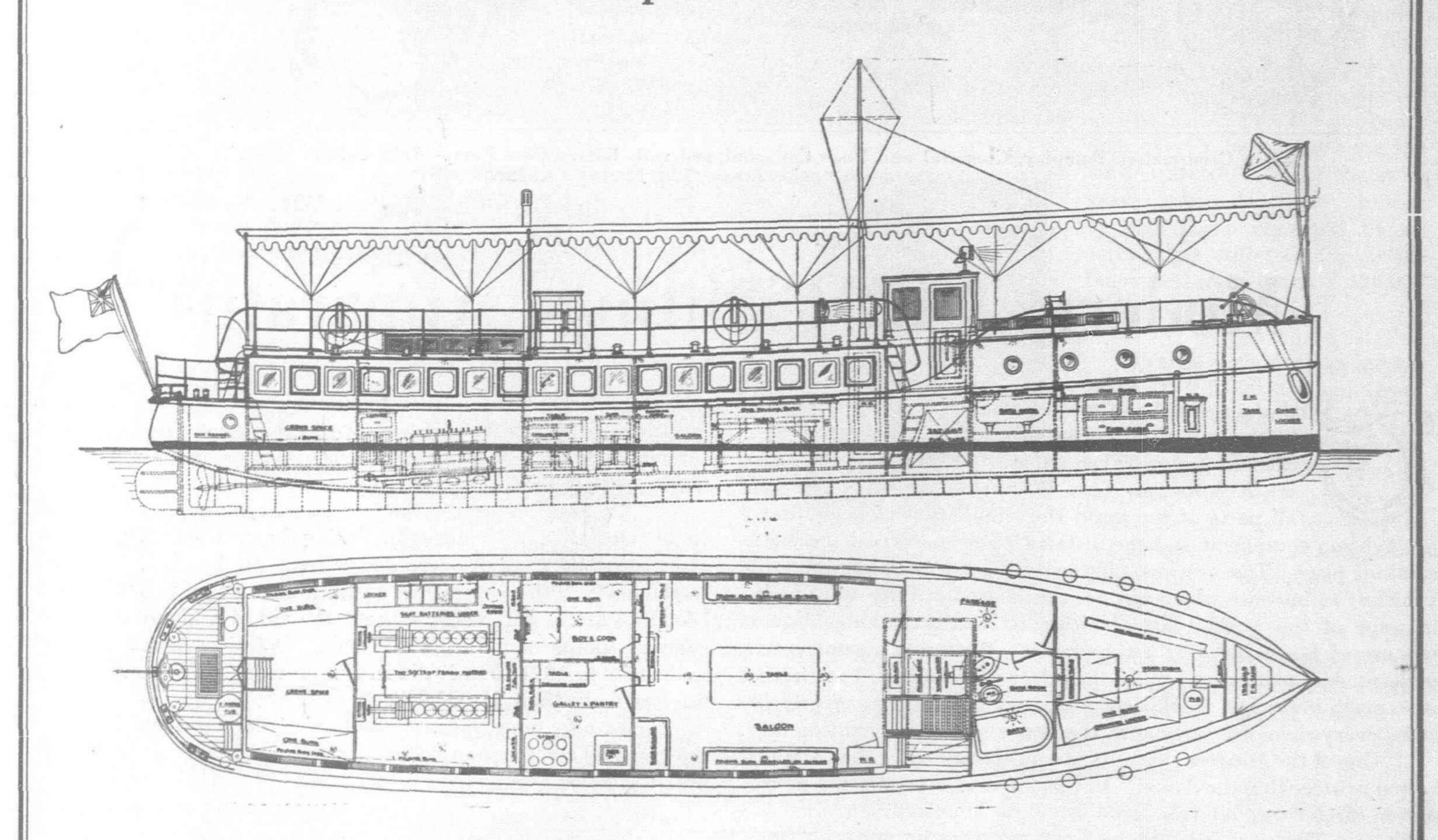
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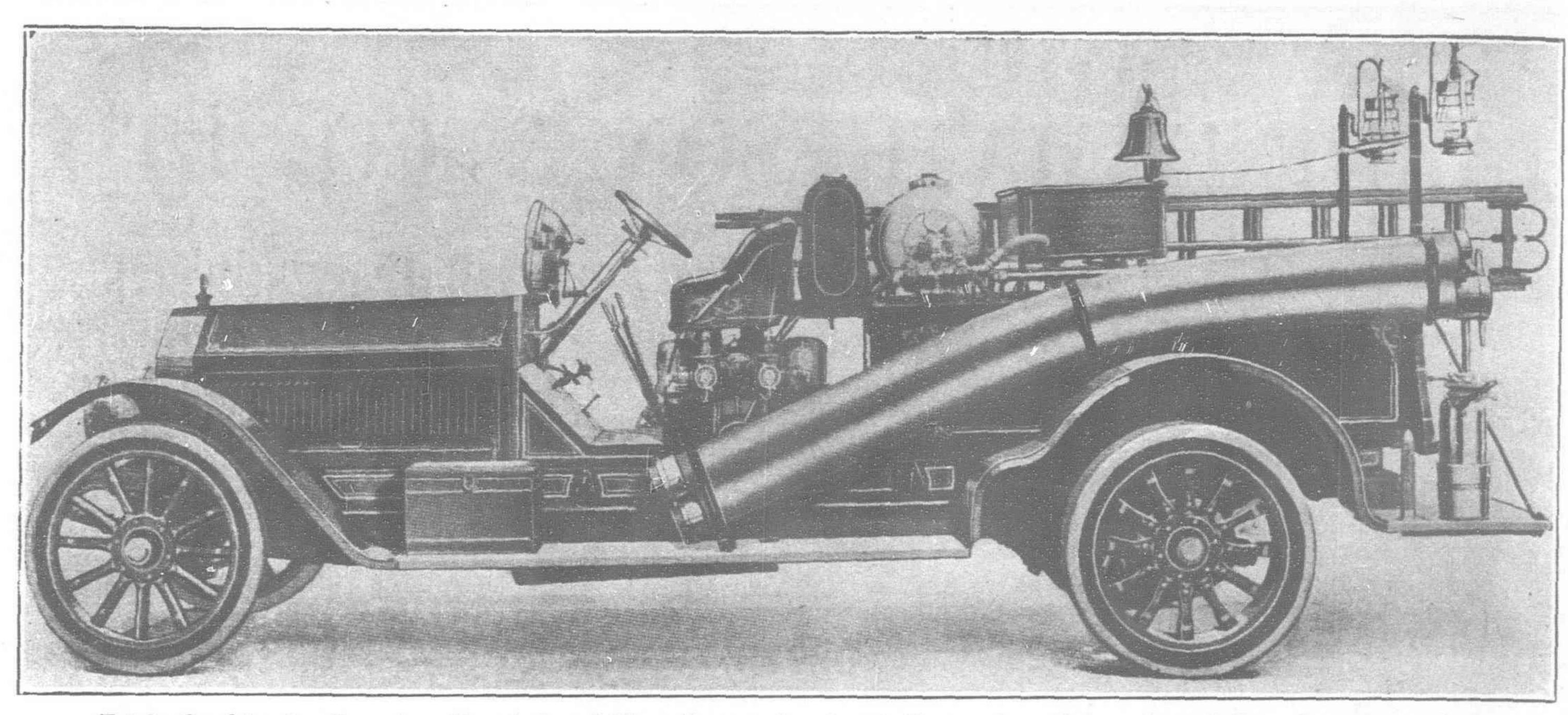
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Triple Combination Pumping, Chemical and Hose Car, equipped with Rotary Gear Pump-1000 Gallons Capacity made by the American-La France Fire Engine Co., Inc.

## Modern Fire-Fighting Apparatus

HE days of the old horse-drawn steam fire engines and trucks are rapidly passing, giving place to the more efficient motor-driven apparatus. Writing in American Exporter, Mr. Geo. W. Sutton, Jr., says that "in all parts of the world the elimination of horse-drawn fire-fighting equipment and the installation of motorized apparatus is taking place. The increased efficiency of motor-drawn fire-fighting vehicles, an increase which has been estimated at fully 40 per cent. in some of the world's largest cities, is rapidly making obsolete the use of horses for this vital service. Motorized equipment is, perhaps, less picturesque than that drawn by horses, but its cost is so much lower and its efficiency so much greater that progressive cities everywhere are turning to the newer method of fighting fires.

"One of the greatest elements in combating fires is that of quick action in attacking the flames. In this important matter the motor-

driven fire truck stands preeminent. The motor fire engine can arrive at a fire and have the fight well under way before the horse-drawn engine has covered half the distance from its stationhouse. Through its characteristic speed in answering alarms, the motorized fire department is able to check fires before they grow large, cutting down the loss of life, property and money which all cities suffer through disastrous fires.

"Wherever a city has substituted motorized apparatus for the old horse-drawn engines, trucks, hose wagons, hook and ladder outfits and the other necessary parts of an efficient fire-fighting department, an immediate improvement has taken place. It has greatly reduced the taxes, due to the maintaining of a fire department because the operating expenses are lower. Feed, bedding and veterinary attention figure largely in the annual appropriation for a fire department employing horses. In the case of the motorized

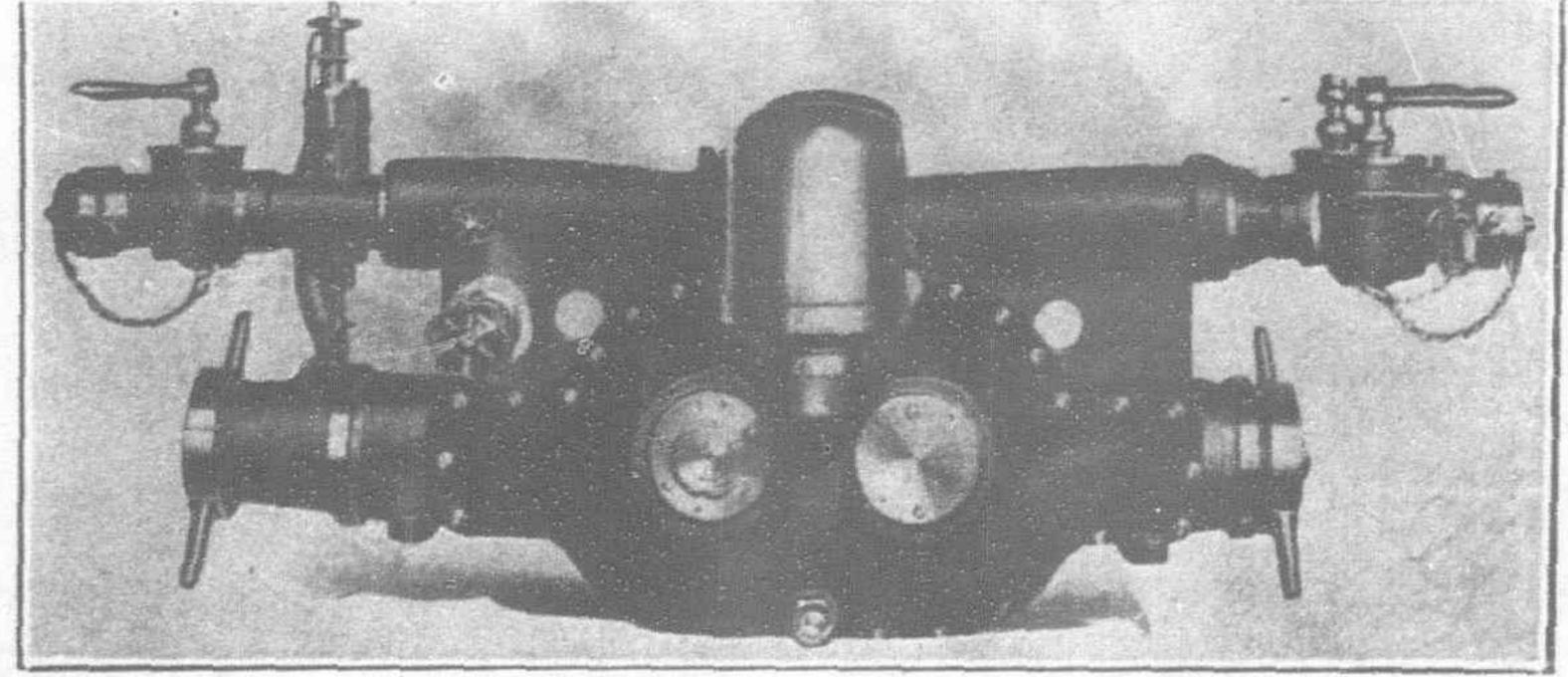
department these expenses are eliminated and the cost of gasoline, oil, tires and repairs has been shown to represent a saving over the former method. A city which once adopts motorized fire apparatus never goes back to the horse-drawn machines.

"Motorization plays an important part in fire prevention work. In the city of Detroit, Michigan, during the past year 35,000 inspections were made to discover and correct fire hazards. According to the chief of the Detroit fire prevention bureau, this would have been absolutely impossible without the aid of a highly mobile and efficient motor squad. As a result, Detroit suffered from 508 fewer fires in 1921 than it did in the previous year and reduced its fire loss more than \$1,000,000.

"Not only does the motorization of fire departments increase the personal comfort and better working conditions for the firemen, but it enables them to do better work. It enables them, for in-

stance, to get into action, after reaching a fire very much more quickly than in the old horse days. With a motor-driven fire engine, it is possible to get up the proper amount of water instantaneously.

"The installation of motorized fire apparatus is a thoroughly modern step in progress. It is going forward rapdily in all parts of the world and, before long, the use of motor equipment for this purpose will be universal in all progressive



The American-La France Gear Pump

cities."

Foremost amongst those who have developed modern fire-fighting apparatus to a high state of efficiency, is the American-La-France Fire Engine Company of Elmira, New York, and here in the Far East their machines have contributed largely to the success of the Tokyo fire department in subduing and controlling the large fires, which, when once started, threatens to wipe out whole wards in that city of frail wooden buildings.

## Aviation in Japan

A New Opening for American Machines

OR the first time since the war it may be said that the Japanese market for aerial machines has opened up opportunities for American manufacturers. The Washington conference amongst other things, has given Americans an opportunity of selling in this market which they did not possess while it looked as though hostilities between the two countries might be precipitated as the result of the misdireced campaign of those who seemed to think that it devolved upon America to draw a cordon around the island empire. British, French, and aviators from other countries, were attracted to Japan and much capital was made out of the possibility of war with America. It ruined all hope of American manufacturers gaining a foothold in this market. Conditions have changed, and the demand for aerial transportation now manifested in Japan carries

with it an opportunity for Americans which did not exist before.

The Japanese-American war scare was responsible for great activity in aviation in Japan, providing manufacturers of other countries an exceptional opportunity of getting their machines placed in this market. At the height of this agitation, it was currently reported in British aviation circles that the Avro Company had over a hundred training machines on order for the Japanese government, in addition to which, the latter had paid the same company the sum of £30,000 for the drawings and manufacturing rights of the standard Avro biplane. Forty Nieuport "Nighthawks," 40 "Sparrowharks" and a number of Nieuport "London" triplanes

were reported to have been ordered from the Gloustershire nautical association, other private interests are making headway. Aviation Company. In addition, Short Brothers sold a dozen or so seaplanes for training, while some of the best of the Sopwith and Handley Page technical experts went to Japan to lay out the Japanese naval aircraft factory and organize production. From the accounts printed in the British and French technical press at that time, there is little doubt that full advantage was taken of a situation that hermetically closed the Japanese market to American aircraft manufacturers. With the Chinese government market closed to others by reason of the Vickers loan, the American manufacturer was quietly but effectively edged out of the Far East. The lead in these markets passed to Great Britain and France. The Washington conference has provided an opening for American manufacturers to retrieve their lost ground.

#### The Imperial Aeronautic Association

One of the most stimulating influences upon aerial transportation in Japan is the Imperial Aeronautic Association of Tokyo, having for its main object the development of aeronautical science and aerial machines for private and commercial use. Prince Kuni is president of this organization, Baron Y. Sakatani, vicepresident and the directorate is composed of about thirty prominent personages.

The director-general of the association is Lieut.-General Kuno. The sum of Y.500,000 has been bestowed upon the Associa-

tion by the imperial court out of the civil list. It was proposed to raise contributions amounting to Y.2,000,000, but had times intervened, and the financial assets of the association now amount to only Y.720,000, including Y.470,000 the balance of the imperial grant. Apart from the imperial grant, Y.100,000 has to remain untouched as a foundation fund. The funds now in the treasury amounts to only Y.150,000.

Next year, an international aerial contest is to be held in Japan by aviators from Great Britain, the United States, France, Italy and Japan. At least Y.300,000 will be required, and the Association is at a loss as to how to raise the necessary funds. The popular subscriptions up to the end of 1921 were less than Y.500,000. The total appropriations for aerial corps of both Japanese army and navy during 12 years up to 1921 were Y.76,020,000, inclusive of Y.41,030,000 for last year, as against Y.120,000,000 for France

> and over Y.100,000,000 for the United States, both for the same year. An American tourist visiting Japan regretted to see aeronautics still toddling in infancy, and contributed Y.176,000 in two instalments.

> France is allowing an annual grant of Y.3,000,000 and Great Britain Y.2,600,000 in support of private airmen, while Japan is giving only Y.50,000 for this purpose. As to aerodromes, Great Britain has 108 private aerodromes and France, 57. whilst Japan has not one.

Notwithstanding the rather



Mr. Yota, Famous Japanese Aviator

gloomy picture presented by the above figures relative to the aero-

#### Private Activities

The establishment of an aerial training school in Nagoya, and the organization of a lake aerial excursion company is contemplated by a civilian aviator of Kyoto. The latter is planning a visit to the United States for the purpose of purchasing a 400 h.p. eight-seater plane.

The reopening of a civilian aviation school at Nagoya, which was temporarily closed, is being planned.

The Mitsubishi Motor Company at Nagoya has made progress in the work of manufacturing the new Mitsubishi type of airplane, and will soon be turning out complete machines. The company's application for permission to establish an aviation field in front of its works at the port, has received official sanction.

A trial flight with an experimental airplane completed by these works, and in which a 300 h.p. Hispano-Suiza motor was installed, showed satisfactory results. While the details of the machine's construction are kept secret, it is said to be a high-speed fighting plane.

Work has been begun by the Aichi Tokei Denki Kabushiki Kaisha (Aichi Clock & Electric Machinery Company, Limited), on a factory in the neighborhood of Nagoya, to which the works of the company, now at Atsuta, will be moved later on. It is expected that it will be completed by the end of 1922. The present

works are capable of turning out one airplane a month, of the Yokosho type; the new factory will have a capacity of 50 planes a month. Special attention will be given to the production of large commercial planes.

The Kawasaki Works of Kobe are contemplating the erection of airplane factories in the Gifu prefecture. Construction was scheduled to be started in November, 1921, and to be completed in the spring of 1922, when 500 workmen will be detached from Kobe to engage in the manufacture of airplanes.

#### General Notes

An aerial passenger service will be established between Tokyo and Osaka the latter part of the summer if the plans of a wealthy Japanese of Hamamatsu prove successful. He is reported to have made application to the national government for permission to establish the service and that his request was granted. According to his plan he will charge Y.90 for the trip between the two cities and will make the trip in three hours.

The greatest activity in opening up aerial routes in Japan seems to be in developing connections with Manchuria. Several flights have been made between Japan and Dairen to date. There has also been some talk about the establishment of a supplementary air mail service between Nagasaki and Shanghai to operate in conjunction with the steamship services of the Nippon Yusen Kaisha.

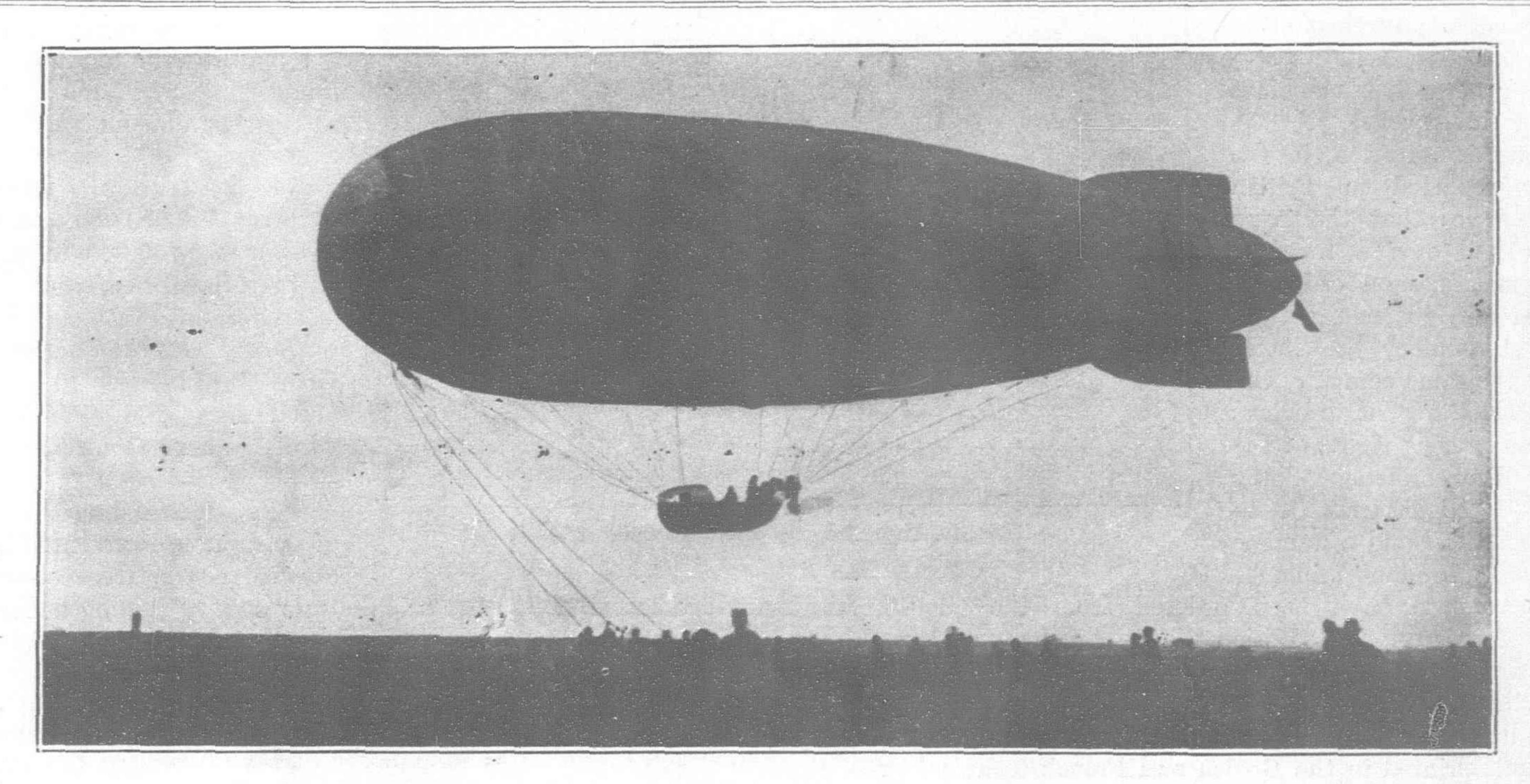
The indications are, however, that unless such a service receives a liberal government subsidy no company will attempt to carry out a scheme which cannot hope for profitable returns as a purely commercial venture.

The Yokosuka naval station aero division successfully carried out a 1,400-mile flight on April 2, 1922, starting from Yokosuka and returning after visiting such places as Kure, Sasebo, Kagoshima and Wakanoura in South Japan. Three F. No. 5 aeroplanes took part in this flight.

Miss Seiko Hyodo, 24 years of age, successfully passed the Japanese government examination for a licence to pilot an aeroplane. She was given a third-class licence, the first woman to be licensed as a pilot in Japan.

#### Incombustible Paints Invented

One of the frequent causes of accidents to aeroplanes is fire. The authorities of all countries interested in aviation have made great efforts to discover some paint which shall make aerpolanes incombustible, so that when the plane is hit by shells, it will not catch fire. The national research laboratory of Osaka has produced an incombustible paint, the main feature of the invention being a fibre treated by acetic acid dissolved in acetone. When this mixture is spread on the plane the aceton evaporates and the fibre is left as a film covering the body. This film is incombustible.



## Smallest Airship in the World

BOVE is a view of the Societa Costruzioni Aeronautiche dirigible, the smallest airship in the world, which was designed by experts of the Italian army service. This new craft is only 117-ft. long and 25-ft. wide and is capable of traveling 45 miles an hour. It is designed especially for light express service.

The S.C.A. dirigible is provided with two engines, type Anzani, which is the same kind as was used by Bleriot when he made his historic flight across the channel in 1911; these engines are of 40 horse-power. With one engine running, this dirigible can attain a speed of 35 miles an hour, and with two engines as high as 50 miles an hour are attained. Fully loaded this dirigible with one engine running, making a speed of 35 miles an hour, has a flying radius of 1,300 kilometres; with two engines, and running at a speed of 50 miles an hour, it has a flying radius of 800 kilometres without stopping.

The S.C.A. dirigible is not intended for passenger service, although it may be mentioned that the first passenger to make a flight in a dirigible of this type was Signor Ferrarin, the intrepid young man who made the flight from Rome to Tokyo something over a year ago.

The gross carrying capacity of this dirigible is 670 kilos. Deducting from this 170 kilos, the average weight of two men, and 100 kilos ballast, there remains a net carrying capacity of 400 kilos, or 880-lb.

The combined consumption of oil and gasoline of the S.C.A. is only 30-lb. per hour and the "bag" only requires a renewal of 20 cubic metres of hydrogen after a day's use. Only two men are required to take it out of the hangar.

The first airship of this type was constructed in the latter part of last year and the first trial took place on the 14th of February this year. The first two airships made were sold to the Spanish government.

### Twenty Years of Motor Car Devotion

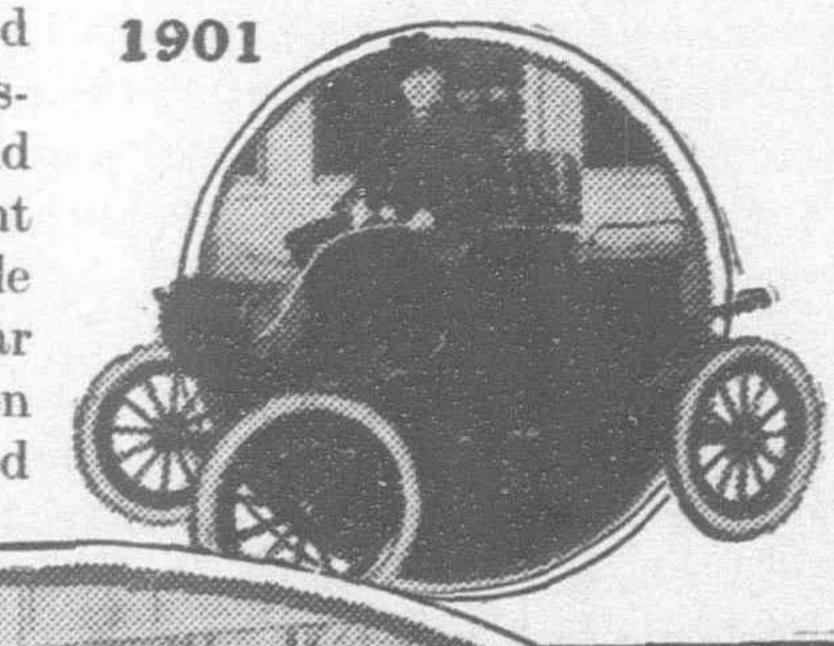
THIS is the story of a man who, for twenty years, has been as devoted to a single make of car-as Damon was to Pythias. It is the story of a record-breaking fidelity, of ownership so , ardent as to be perhaps unparalleled anywhere.

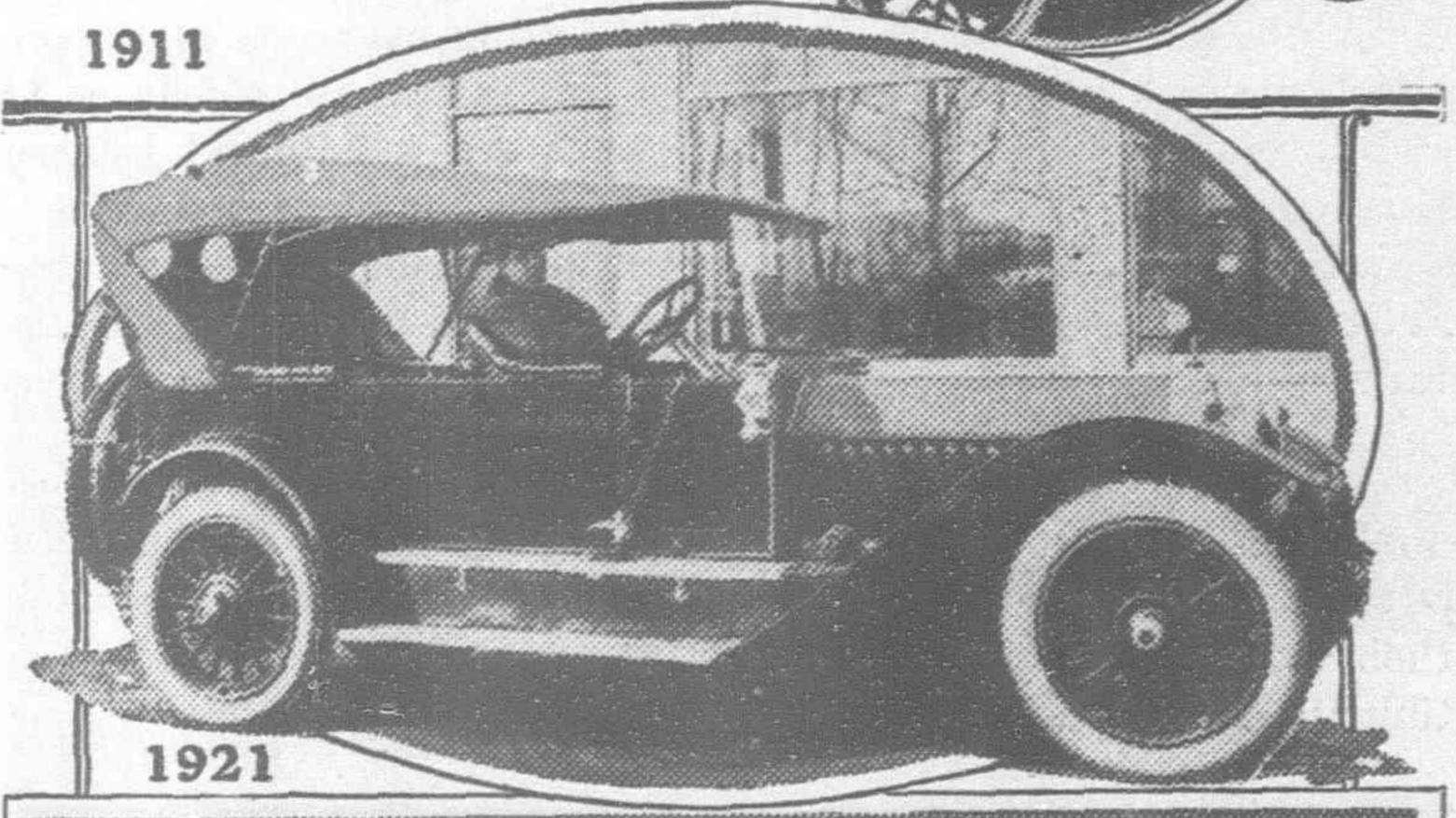
Fittingly enough, this "Damon" who is so remarkable an advertisement for the Oldsmobile motor car, is himself a noted advertising man, Mr. J. P. Muller, president of a large New York

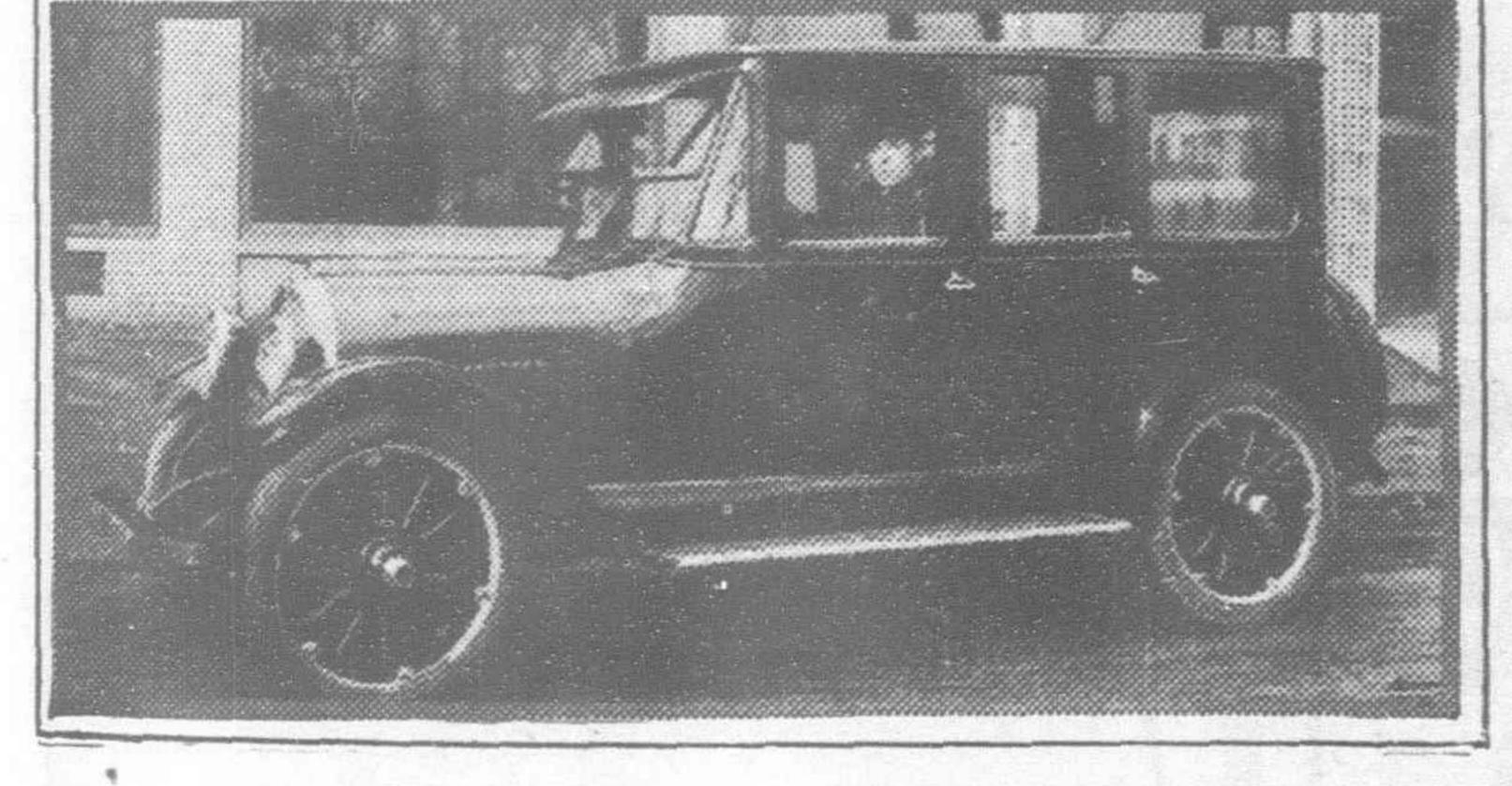
advertising agency.

Mr. Muller has gone through two decades of Oldsmobile ownership in New York city. Although the illustrations show him in only three cars, it is nevertheless a fact that he is the only individual on the face of the earth who can claim the extracrdinary distinction of having owned a car of each year's output of the Olds Motor Works.

When Mr. Muller was asked what he did with his fleet of Oldsmobiles and what use he could have for such an assortment when it was physically impossible for a man to run only one car at a time, he replied that when he bought a new one, he passed







the older one along to relatives. Finally he found himself, his family and his relatives in possession of so many Oldsmobiles that the simplest way to manage his fleet was to go into the garage business.

With some associates he organized the Thoroughfare Auto Supplies, Inc., at Elmhurst, Long Island. Arrangements were made to sell Oldsmobiles and to-day the company is one of the most active in the metropolitan district.

His trio of cars, pictured here, forms an exhibition in the thoroughfare garage that has attracted widespread attention because it shows so graphically the transition through which the automobile has passed, and in which the Oldsmobile has always played a leading part.

Mr. Muller is a keen student of motordom and its affairs. At a convention held in January, Mr. Muller's speech was the subject of considerable comment in the automobile columns of the daily newspapers. He pointed out that in relative value the Oldsmobile

"four" of to-day costs less than half of what the 1908 Oldsmobile brought. The older model, Mr. Muller said, had no magneto, no electric lighting equipment and no self-starter. Had this car been equipped with windshield, top, speedometer and the many other sundries which are now embodied in the modern car, its cost would have been over three times that of to-day.

It is a far cry, indeed, from the perambulator type curved dashboard Oldsmobile of 1901, which was the cynosure of all eyes wherever it appeared, to the trim, beautiful, efficient car of the present. It is an equally far cry from the 8 horse-power Oldsmobile to the 90 horse-power machine, the smallest and the largest turned out of the factory at Lansing; but Mr. Muller still owns them both.

Periodic offers have been made him for the two older cars pictured here, but he has refused to part with them under any circumstances. He regards them as precious possessions and inasmuch as he is still in his forties, he hopes to add two or three more decades of Oldsmobiles to the exhibition.

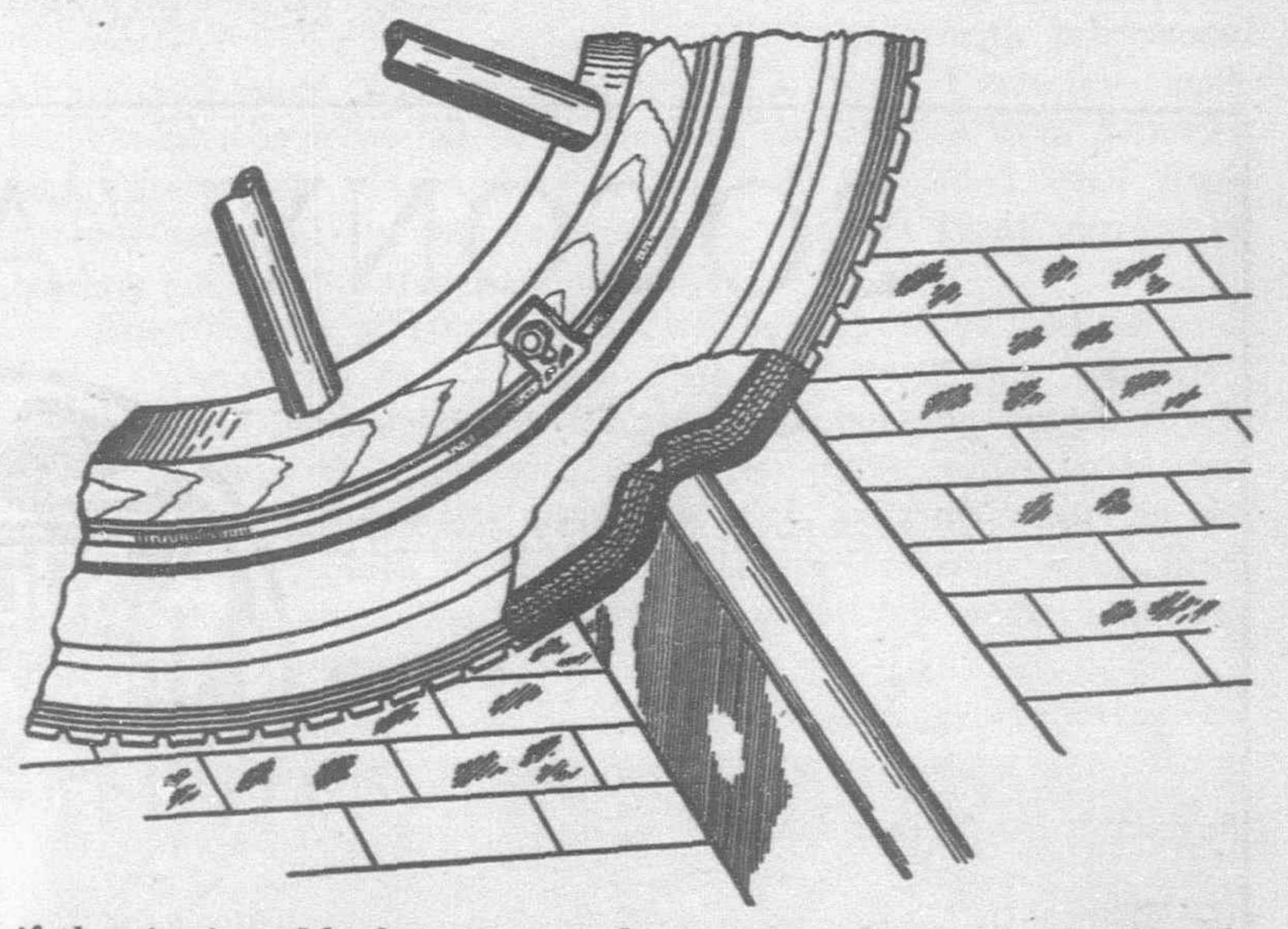
### Tire Bruises

"STONE bruise" is the term used to describe an injury to a tire caused by striking some object with sufficient force to cause the tire fabric to be broken. It need not be a stone that causes the damage.

The break in the fabric may be in only one ply or it may be in all of them: but in any case it is always the inside ply that breaks first.

An inexperienced driver whose tire gets a heavy blow from a stone or a curb usually looks over the outside of the tire to see if any damage has been done. But the old driver knows that if harm has been done the place to look for it is in the inside and that any break in the fabric will be registered on the inside ply first.

Normally the inside ply is shorter than the rest and each ply is shorter than any of the others which are located outside of it. This is because it is on the inside of the curvature of the tire. Now



if the tire is suddenly compressed at some point to a considerable extent, such as shown in the illustration, the relative position of the plies is reversed, that is, the outside ply becomes, at this particular point, the inside ply as regards the curvature and the inside ply becomes the outside ply, as regards curvature.

This has the effect of stretching the inside ply more than any of the others, and, of course, if the amount of stretch is very great, the fabric will be broken.

If it should happen, as it often does, that only one or two inner plies are broken, there will not be any signs of the injury on the outside until a considerable time afterward. This is because the other plies still unbroken will continue to hold against the air pressure even though they will be under excessive strain. But continued flexing will eventually break them also and the result

may be a blow-out which may occur at any time, even on a perfectly smooth pavement.

Another effect of a break in one or two inner plies may be that from continued bending the broken edges of the fabric rub a hole in the inner tube at that point. Sometimes the break is so pronounced, especially in a fabric tire, that the air pressure forces the inner tube into the break, and as this is continually closing and opening, as the tire rolls, the action is like a pair of pinchers and cuts the tube.

If the tube is chafed through or cut after a bruise, such as described, the air will pass directly through the carcass and force the rubber covering, and sometimes the tread, loose from the fabric. When this happens the user generally terms it a blow-out and as a matter of fact it is; but contrary to the opinion often held, it is seldom the result of a defect in manufacture. It can generally be traced to an injury sustained some time prior to the final breaking down of the tire.

### Motor Coaches for the Manila Railway

A UTO truck competition has increased to such an alarming rate with the service of the Manila Railway Company, especially in the districts adjacent to Manila, that the railway is being hard pressed to cover expenses. The lack of supervision over auto trucks by the public utility commission makes the competition extremely severe and one which can only be met by reducing the fares or providing more frequent and cheaper transportation. The board of directors of the railway, therefore, recommend the use of motor propelled coaches on designated rail lines. The company has started an auto truck service of its own between Noveleta and San Roque in the province of Cavite with two trucks. From March 1921 when the first truck was placed in operation and May when the second was placed on the run, the two trucks handled 49,170 passengers with receipts of Pesos 9,834 and expenses of Pesos 10,212, which does not include depreciation and interest on the investment. The present fare of 20 centavos is to be increased.

### Motor Transport in Malaya

A CORRESPONDENT, writing to Motor Transport, points out that considerable expansion is taking place in the motor trade with Malaya, owing to new road construction. A considerable demand exists for motor vehicles, including cars, motor cycles and trucks, although depression in the rubber market has affected purchasers to a certain extent, but the present conditions of the trade are merely temporary, and on the whole are favorable to British suppliers.

Prices, quality, and appearance influence the choice of Eastern motor buyers; but light, serviceable vehicles are the best sellers. With a stablished market, expansion of business will follow. The value of this market to the British motor industry is beyond dispute. The field for enterprise is a British colony, and although United States agents are active, there is a preference for our products. If our manufacturers will study the tastes of the Chinese community, amongst which the readiest purchasers of machines are found, they will compete successfully with the medium priced United States vehicles.

Trucks find a ready sale, and are largely used in Singapore for moving goods, and also for motor 'bus service and they may be seen far out in country districts, shifting marketable produce and conveying passengers, to the increasing exclusion of the primitive bullock carts. The motor 'buses in use are chiefly on 1½ and 2-ton chassis, and regular services are maintained between Kuala Lumpur, Raub and Kuala Lipis in the state of Penang—a distance of 120 miles, chiefly over mountain roads—and they radiate from Kuala Lumpur in all directions, competing with the railways.

Only light cars and trucks are in demand; few 5-ton, and no 10-ton trucks are used in the colony, owing to the character of the roads, and to the fact that light trucks are more economical, their prime cost being less, whilst they are capable of more continuous operation.

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Are manufactured for a simple purpose . . . to lubricate automobile engines. The rich lubricating qualities of our oils afford perfect lubrication to the wearing parts. Not only is this true in summer, it is equally true in Midwinter.

We have four grades of Auto Oils to meet every condition and requirement of the motorist.

Auto X Light
,, XX Medium
,, XXX Heavy

"XXX E. V. Extra Heavy

Obtainable at any Garage in China

## Motor Vessels Developing Siberian Trade

T is probably not realized generally that the development of the motor vessel is making possible the opening of a vast trade between Puget Sound and Siberia, says Donald Harris in the Pacific Motor Boat, but this is nevertheless true. It is probable that without the

economical transportation which the motor vessel is able to afford, this great commerce, which is only now in its infancy, would not have been developed.

Motorships are peculiarly adapted to Siberian coast commerce and fur-trading needs. R. S. Pollister of Olaf Swenson & Co., the new Russian-American combine, with headquarters in Seattle, which is behind the development of much of the Siberian trade, states that the cruises of 15,000 to 20,000 miles made by fur-trading vessels during a season, in regions without fuel bases, require the increased cruising radius which the compactness

of oil fuel gives and which the steam vessel lacks. Oil engines have been found thoroughly suited to Arctic trips by this company. Motorships are rapidly becoming universal in fur-trading, and will find more and more employment as the rich trade possibilities of the Siberian coast are developed.

The motorship *Mazatlan*, owned by this company, left April 8th for the Kamchatka peninsula, with a \$400,000 cargo of general merchandise to supply the company's numerous stations and to use in trading with independent trappers. She and her smaller sister ship, *Chokotsk*, will cover the entire Kamchatka peninsula, the Okhotsk Sea and the Arctic coast of Siberia.

The Mazatlan is 987 tons gross in weight, and carries a 1,500-ton cargo. She is 180 feet long, 37 feet in beam and has a draught

of 16½ feet. Fuel oil is carried in her double bottom, her capacity being 1,370 barrels. Her speed is approximately 250 miles a day, and a day's fuel consumption 23 barrels. This will enable her to cover her 15,000 miles in about two months without taking on more fuel. She is powered with two 400 h.p. Winton full Diesel

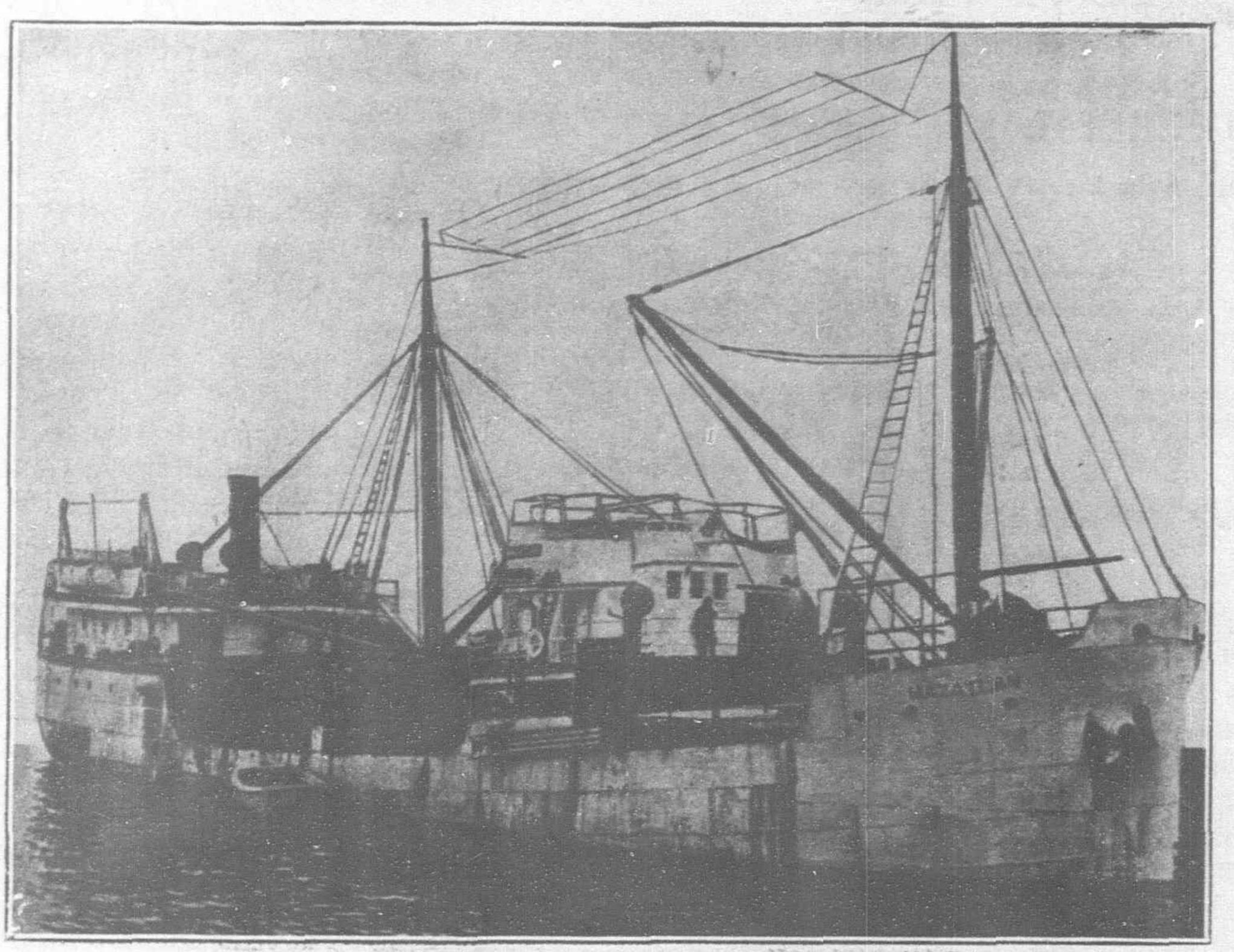
engines, and has two 60 h.p. Fairbanks-Morse auxiliary engines.

She also carries three 25-foot power tenders equipped with 24 to 30 h.p. Kahlenberg engines. The Siberian coast is so rough that goods usually must be landed through the surf. Moreover, thousands of miles in short side-trips are saved by the use of such tenders. Six other power tenders, ranging from 9 to 25 feet, and with Kahlenberg and Lathrop engines of 20 to 30 h.p. are being taken overseas to sell.

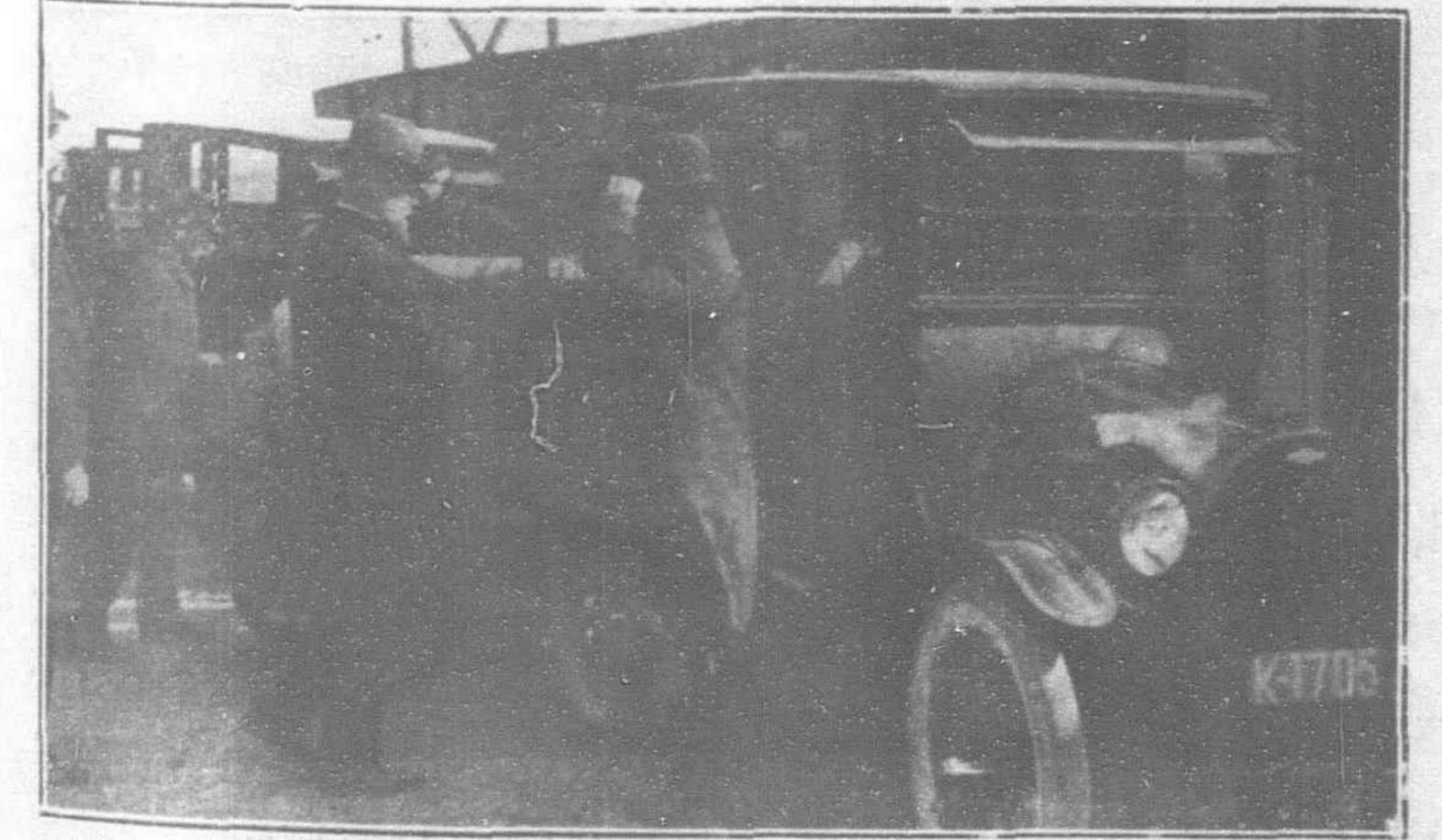
The Mazatlan's forward hold is fitted out like a store, so that independent trappers dealt with may come

dealt with may come aboard and select goods as they might at a shop. Heretofore, such cargoes have been carried in boxes just as received from factories and wholesalers. Three sides of this hold are lined with huge shelves arranged in compartments in which a great variety of

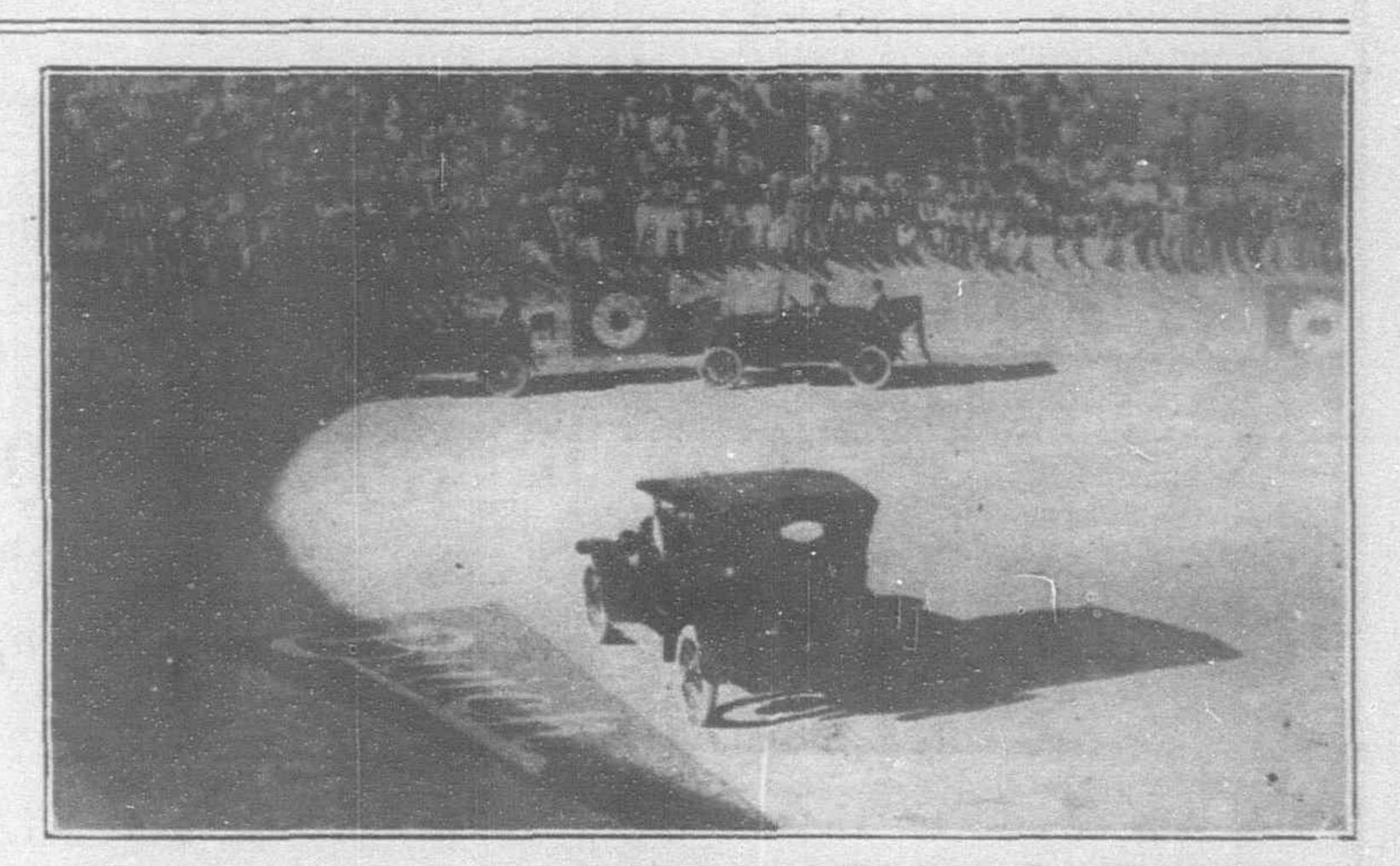
The Chokotsk, a 110-ton vessel, will be sent out by Olaf Swenson & Co. about the first of May. She will cover the company's northernmost territory, north of Kamchatka, running into the Arctic Ocean as far as the Kolyma River. The purse seiner, Blue Sea, will follow her about the middle of May, and will winter in the Kolyma River. Both of these vessels are powered with Fairbanks-Morse engines, the Chokotsk with a 140 h.p. engine, and the Blue Sea with one of 45 h.p.



The Motorship "Mazatlan," fitted out for Siberian Trading

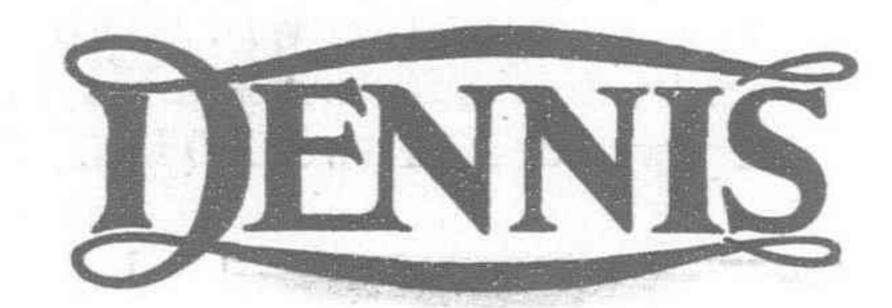


Prince Consort Henry of the Netherlands entering a Chevrolet Sedan on his visit to the province of Zeeland. The Prince's visit was made to lay the cornerstone of a monument commemorating the losses suffered through the recent inundations of the district by heavy storms opening the dikes.



A unique motor car advertisement, staged during the procession around the ring that preceded a recent corrida de toros at Queretaro, Mexico. A new Buick car on the floor of the arena is the centre of attention.

#### FURTHER BIG REDUCTIONS



#### COMMERCIAL MOTORS

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Type	To-day's Price	Price Jan., 1921	Reduction	
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4-ton Long Wheelbase Omnibus Chassis 5-6-ton Lorry Chassis	£950 £960	£1,200 £1,320	£350 £370	

The prices given above are F.O.B. Guildford, England

WITH a view to stimulating trade and maintaining employment, we have written down our Stocks to a figure very much under cost, and this, with the wages reductions that will take place in the near future, has enabled us to sell our Chassis as from October 1st at the prices mentioned opposite.

Purchasers of "DENNIS" vehicles, even at such low prices, can feel perfectly assured that they are acquiring absolutely new goods of latest and most improved construction, as Dennis Brothers have never purchased or taken back second-hand War Lorries. The Vehicles we are offering are absolutely new and embody improvements on previous models. We have been able to keep our factory busy on new productions, and are not selling Chassis made two to six years ago and re-purchased from the Government, nor are we offering re-conditioned War Chassis.

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Messrs. Alex Ross & Co. Ltd. Machinery Department Hongkong

Cables: A.B.C. 5th Edition, Lieber's, Bentley's, Marconi. Messrs. Central Garage Co., 5 Hongkong Road, Shanghal.
Messrs. Alex Ross & Co., Ltd., Machinery Department, Hongkong.
Messrs. Fikkert Motor Car Co., Weltevreden, Batavia.

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GUILDFORD, ENGLAND

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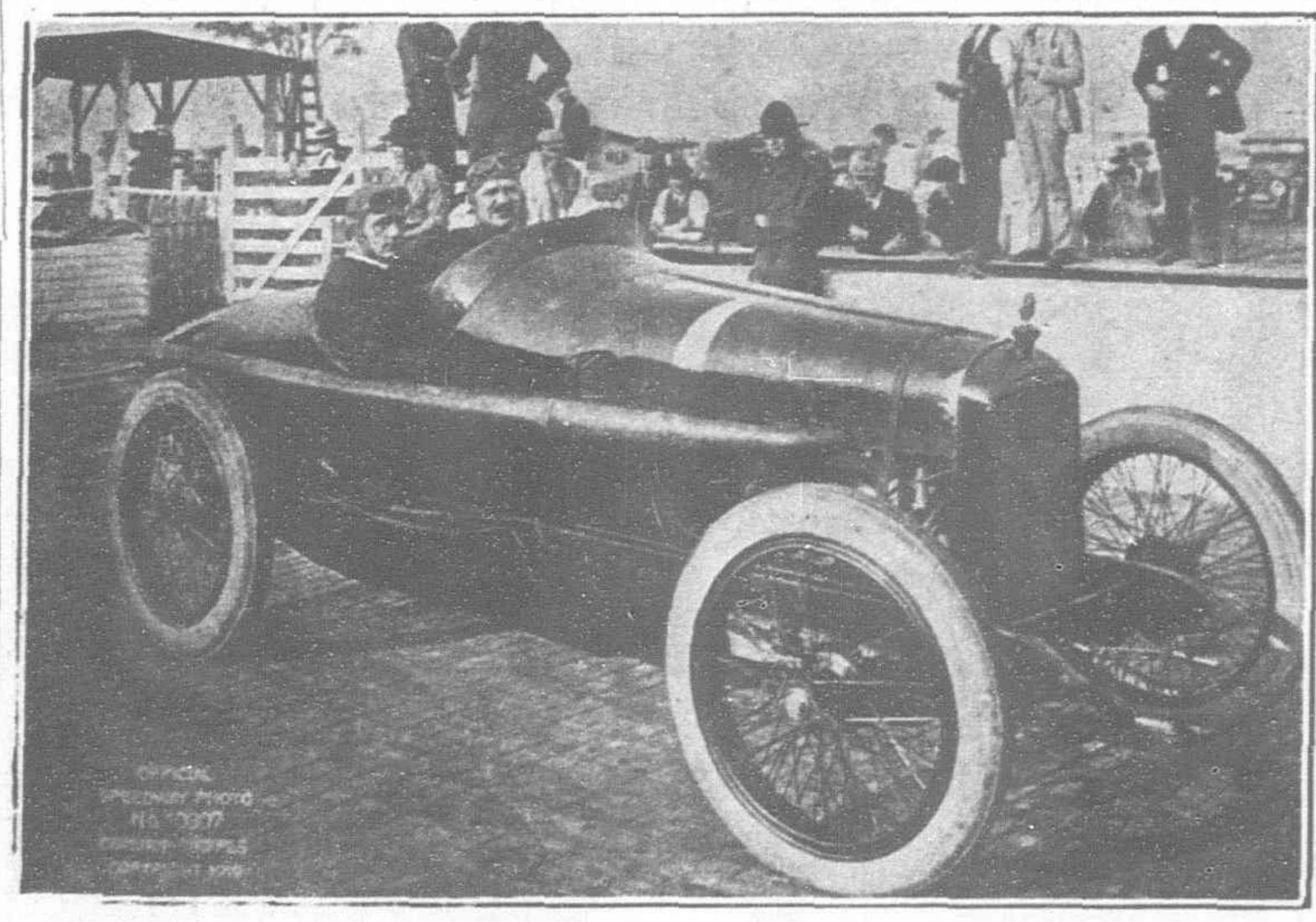
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No. 677 is graphited grease of medium density that flows over the gears like an oil, yet possesses the peculiar property of not settling when the gears are not in motion. It reaches all the bearings and provides a graphite coating that prevents wear, reduces friction and causes cool running at all times. No. 677 remains unchanged in hot or cold weather. It will last far longer than the best plain grease.

No. 677 is recommended for transmissions and differentials, except those designed for light oil lubrication. The consistency is about that of heavy gear oil. It is also the most satisfactory lubricant for electric gear shift mechanisms, the reverse gears of power boats, and for change-speed gear

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Dixon's Graphite Cup Grease No. 3 is recommended, except in warm climates, where No. 5 is more suitable. The consistency of each grade changes but little under wide temperature variation.

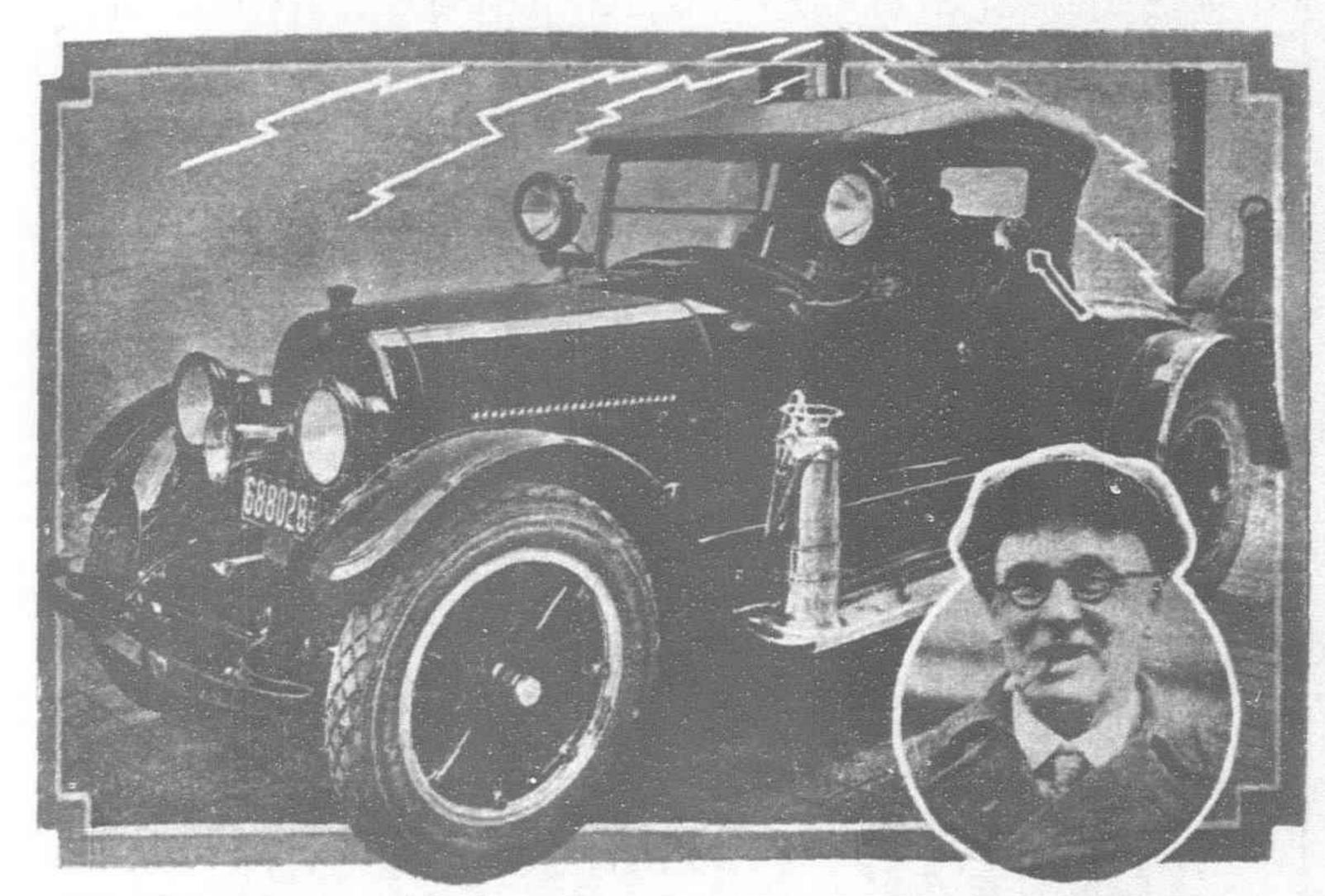
The importance of attending to the numerous small bearings and moving parts of cars is frequently overlooked. Wherever you see a grease cup don't think it is put on as an ornament, but give it a turn once a day or once a week according to the requirements. Don't forget to keep the cups filled with grease.

Sold in one, five and ten pound tins. Larger packages if desired.

### Fires Soon Mastered with Aid of Cadillac Radio Roadster

FIRE-fighting and fire-signalling equipment seems to have reached the acme of its development, when one considers the huge motor-driven machines, with their loads of ladders and their squads of trained firemen, which plunge down the streets of any large city as soon as the alarm bell sounds from the fire-station tower.

Within the last few months, however, Fire Chief Garrett of Dallas, U.S.A., has developed an entirely new and effective method



Fire Chief Garrett of Dallas, Texas, and his Cadillac Radio Roadster

of keeping in touch with incipient blazes; that bids fair to be adopted by fire chiefs of other cities as well.

This scheme of Chief Garrett's is embodied in the Cadillac radio roadster—a standard Cadillac type 61 car equipped with wireless telephone attachment, in which the Dallas fire chief travels about the city.

A short time ago it was visibly brought home to a Dallas observer how Chief Garrett, by means of his radio roadster, could keep closely in touch at all times with fires and their location.

The red Cadillac roadster, with its big headlights, its wireless mast and Babcock fire extinguishers, was seen moderately jogging down one of the main streets of Dallas. All at once the car was seen to come to an immediate stop—the gears were thrown into reverse and it swerved about. Then with a strident yowl from its big warning signal, it dashed away in the opposite direction.

Within another minute the sound of a fire alarm, tapping out on the central station bell, was heard.

Chief Garrett had received the information of the fire and the location of the alarm before the machinery which set the bell to tapping could be put into operation.

The receiving apparatus of the Cadillac radio roadster is neatly and compactly tucked away in a black box behind the driver's seat, and the wireless messages are sounded from a horn close by the driver's ear.

Chief Garrett is very modest in describing the successful operation of his fire-detecting mechanism. He says:

"There isn't much to that; its simple. All you do is tune up and the man at the central office just talks into the transmitter, and it comes out through this horn. It isn't any trouble to hear what he says."

### The Rarity of Air Travel Accidents

BRITISH publications, from all indications, are certainly behind aviation and are doing their utmost to encourage the industry. The recent collision of two air expresses on the London to Paris airway which resulted in the loss of six lives, has

occasioned editorial comment on the part of several publications wherein the comparatively few airplane accidents in relation to the considerable number of flights made was pointed out.

The Illustrated London News, in this connection, devotes an entire page in its issue of April 22nd, to a graphic chart showing the extent to which commercial aviation was operated between different countries in Europe during the years 1920 and 1921. From this chart the following pertinent data is gleaned:—

			Continental Flights				
		N			Passengers Carried		
			1920	1921	1920	1921	
British machines	,		2,854	993	5,799	5,256	
French machines			657	1,565	486	4,352	
Belgian machines			104	421	98	630	
Dutch machines			5	366	0	480	
By others	1		0		0	13	

Grand total of flights and passengers carried to and from

England .. .. 3,620 3,345 6,383 10,731

Goods transported by air—1920—imported total values £677,-047, exported total values £351,765; 1921—imported £375,474, exported £195,826 (Britain).

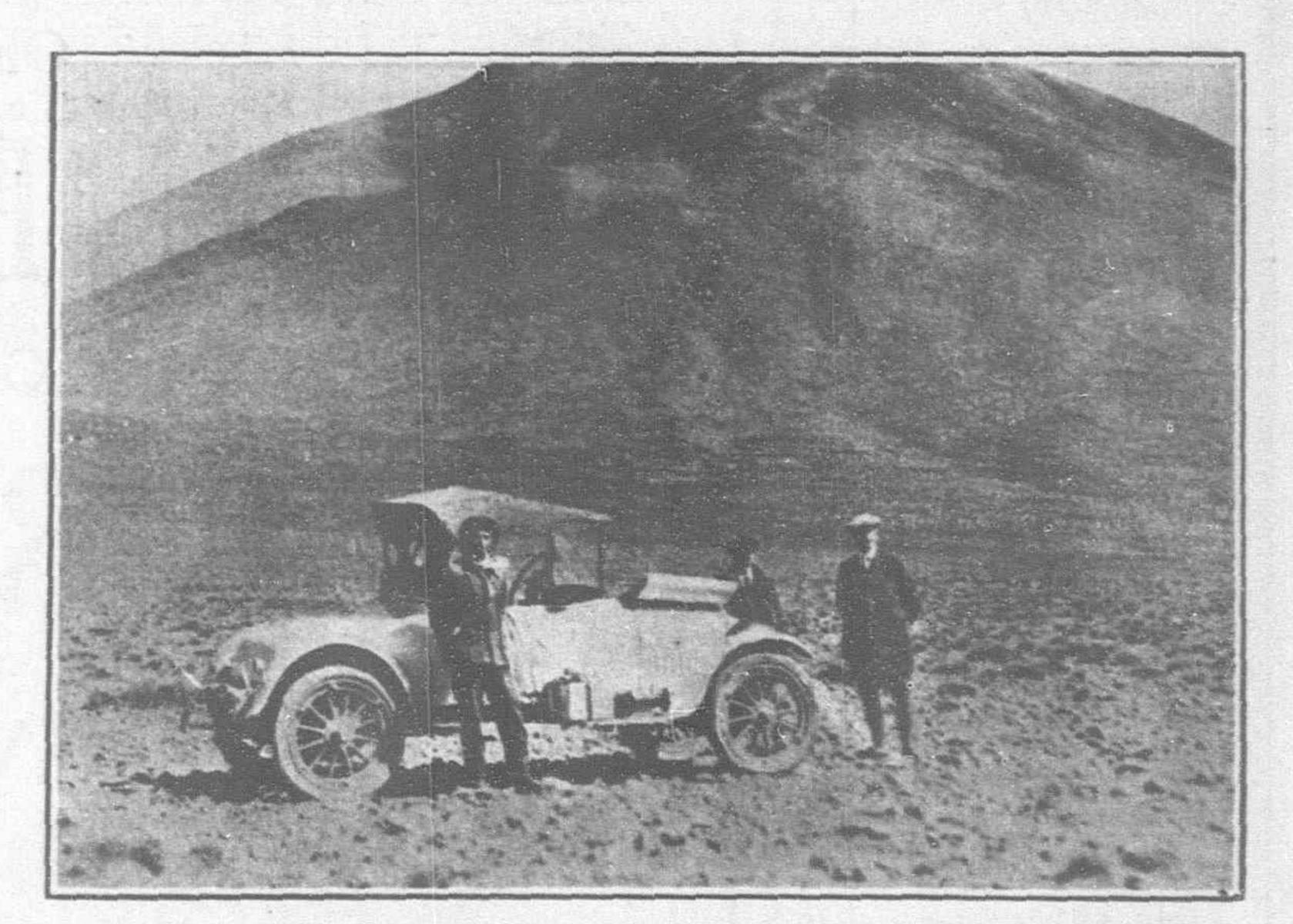
Accidents in British civil aviation (including continental routes:—

Year 1920—out of 42,296 passengers (mileage 546,400m.) 14 killed, 15 injured.

Year 1921—out of 42,680 passengers (mileage 452,000m.) 3 killed, 6 injured.

The totals of British civil aviation flights are (for 1920) 26,803 flights, (for 1921) 23,152.

It will be noted from the above that there was a decided falling off in the number of flights made in British machines during 1921 as compared with the preceding year, though in the matter of passengers carried the disparity is not so great, the number in 1921 being 543 less than that in 1920. To offset this, however, a considerable increase in flights and passengers carried by French, Belgian and Dutch machines is shown for 1921 as compared with the 1920 figures. Of much significance are the statistics on accidents, for although the number of passengers taking flights in airplanes during 1921 exceeded the number carried during 1920, only 3 were killed and 6 injured during 1921 as against 14 killed and 15 injured in 1920, indicating that great strides have been made in the matter of making the airplane a safe means of rapid transportation.

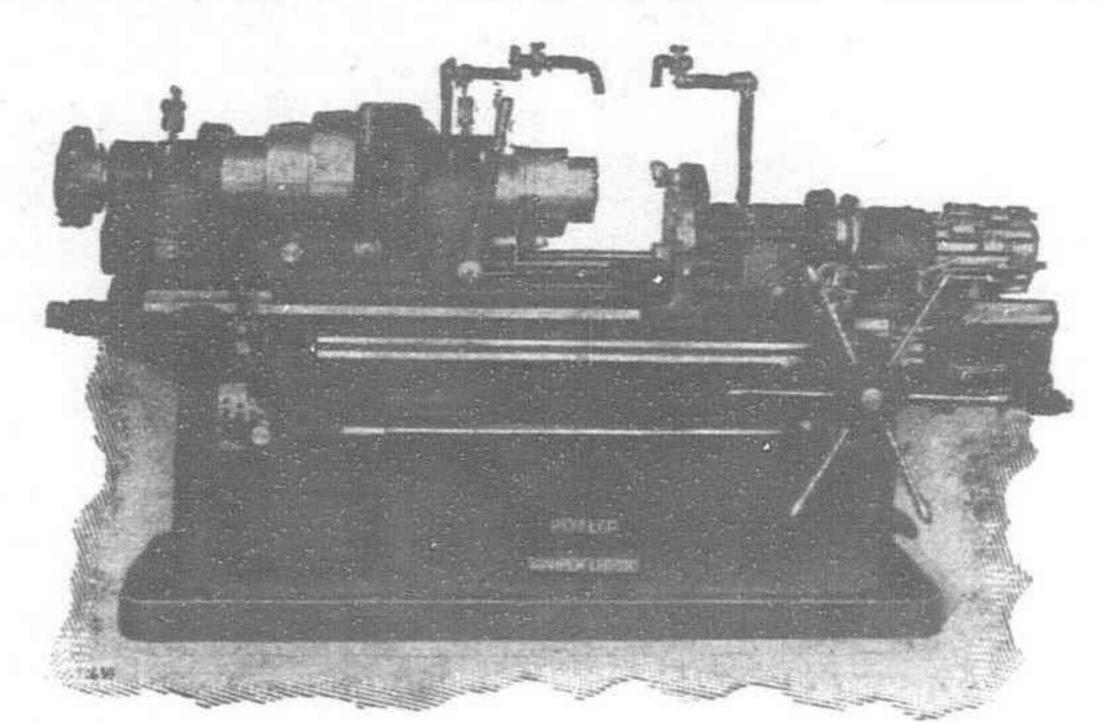


A scene in the mountain-crests of Chile, at the tremendous height of 15,500 feet—nearly three miles above sea level. The car shown is an Oakland. It operates regularly in the highly-rarified mountain atmosphere, being used by the Pederosa Mining Co., Ltd., who describe it as "a powerful and wonderful car"



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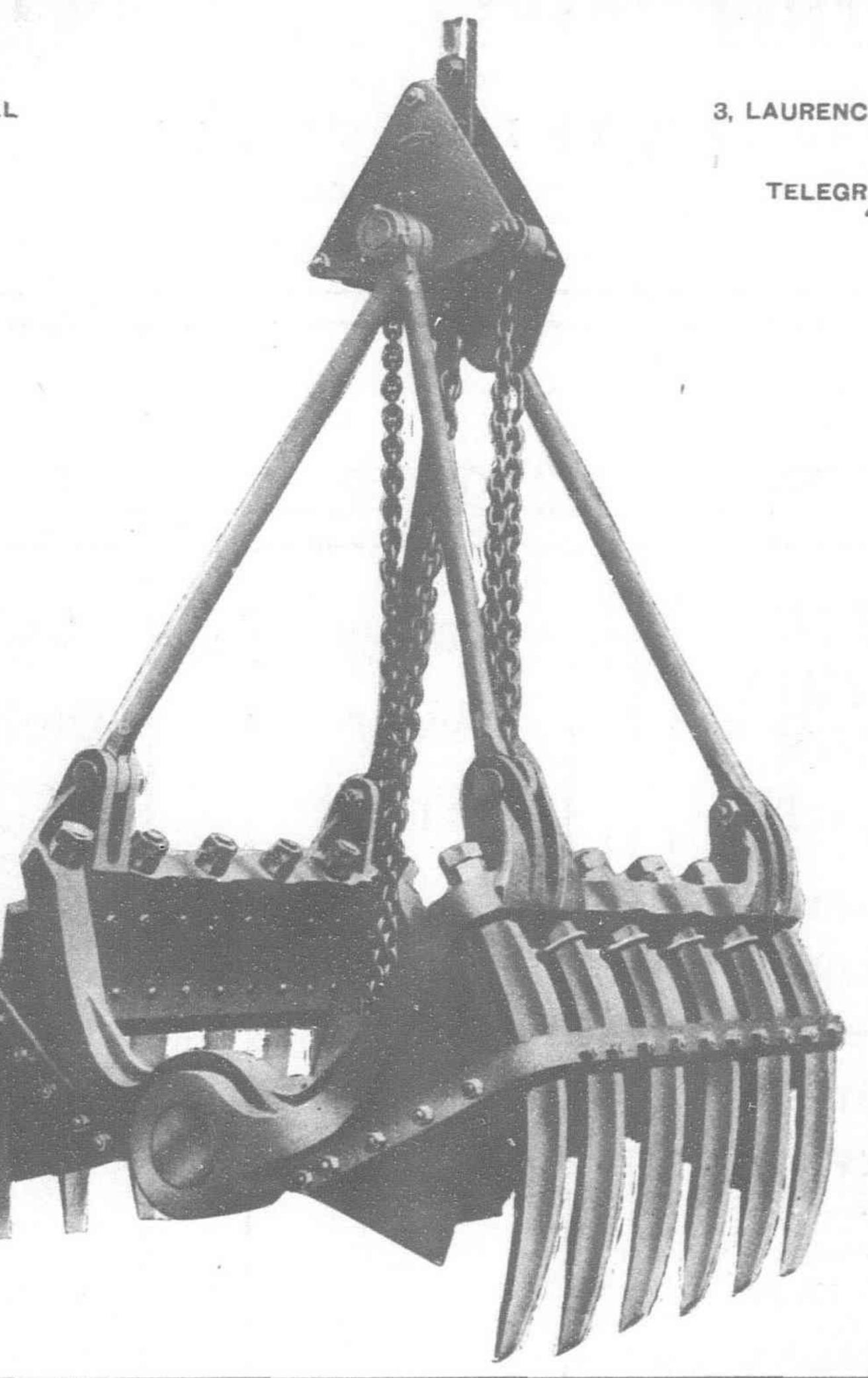
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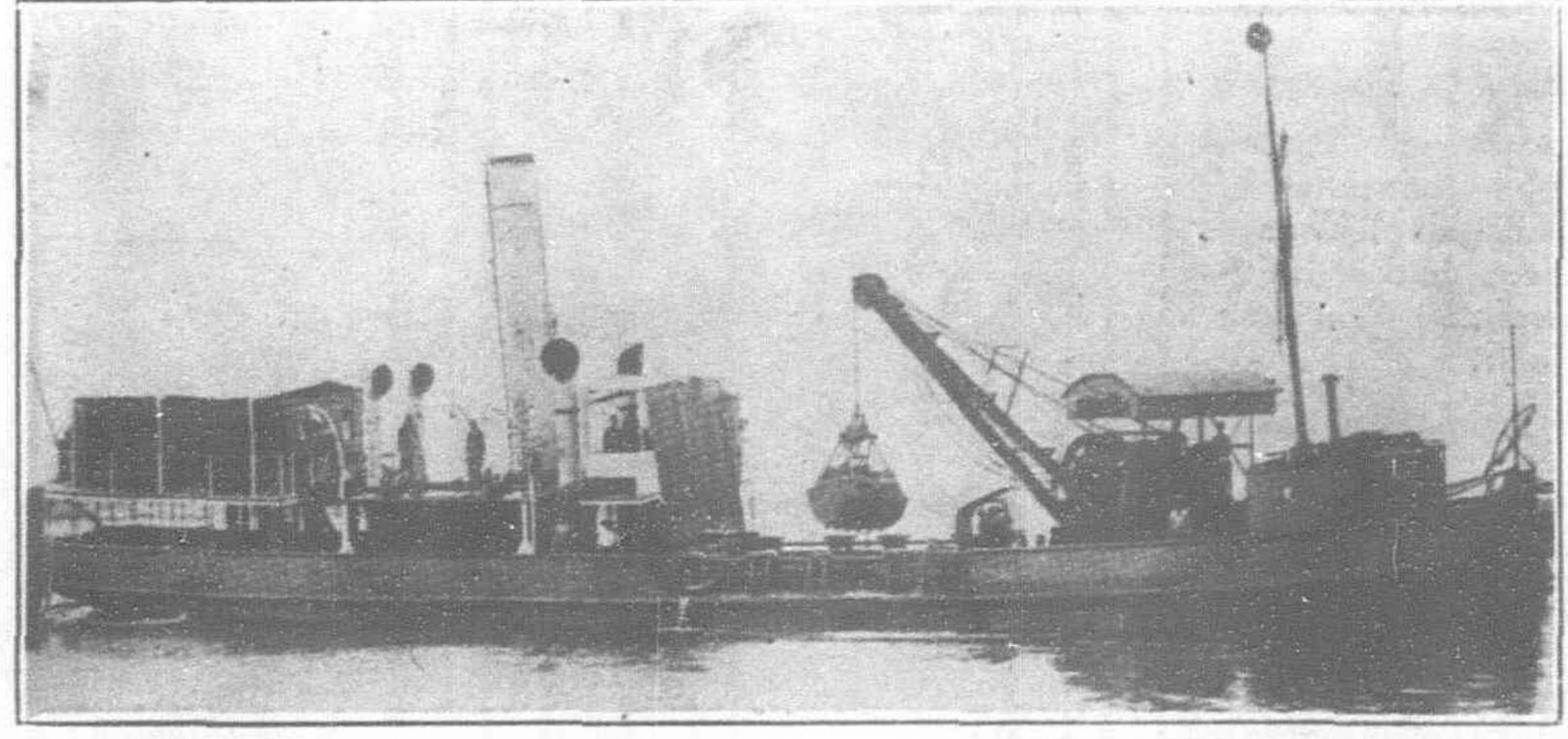
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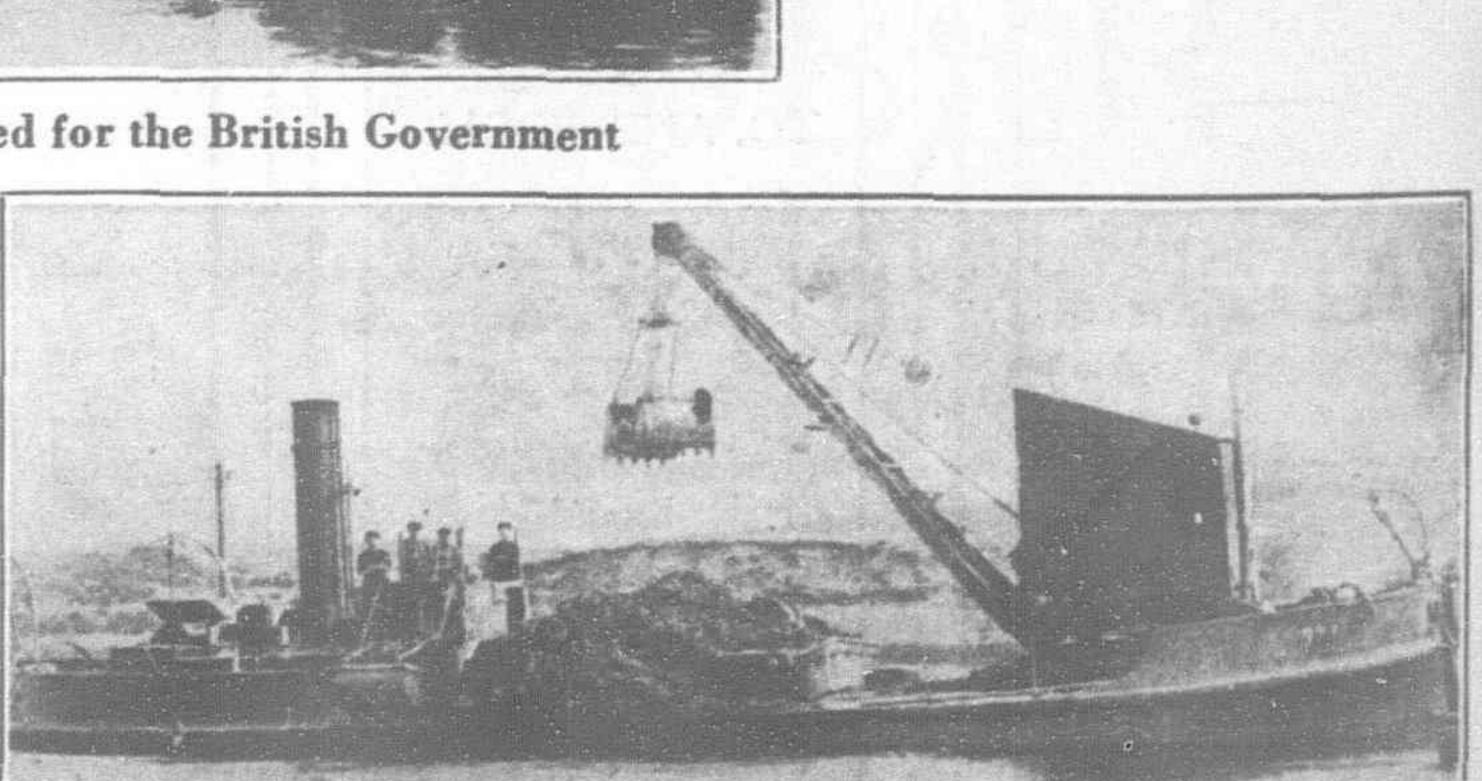
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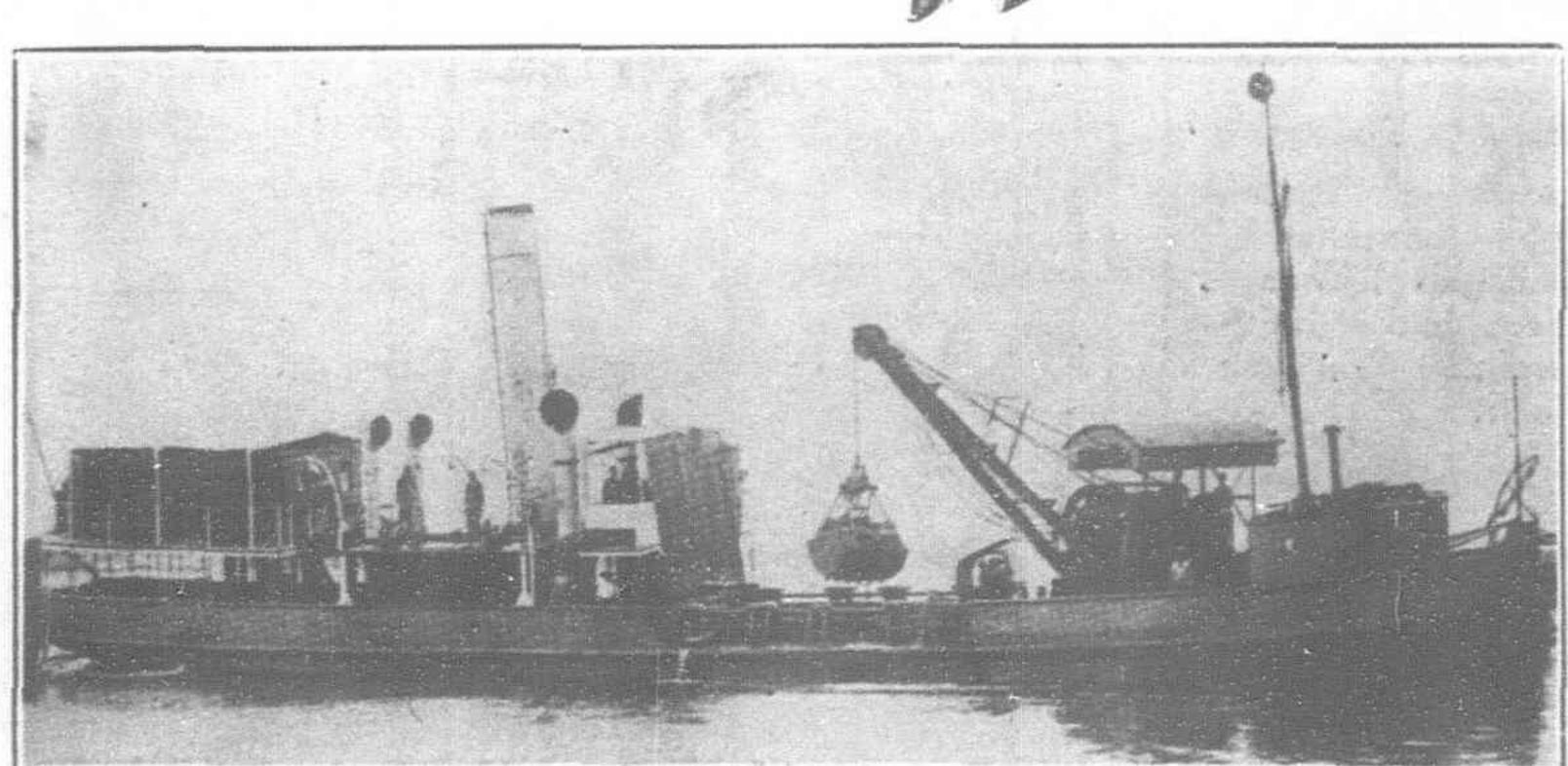
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